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EDITORIAL NOTES

THE CENTRAL REGISTER

A FEW weeks ago we referred in these columns to the Central Register compiled by the Ministry of Labour and National Service with the help of professional organizations, and we pointed to the need for the record being a complete one to ensure that the services of professional engineers shall be used to the best advantage in the national interest. We also mentioned that for the efficient operation of the Register members of The Institution of Gas Engineers should keep the Institution informed of any change of address or employer and any additions to existing professional qualifications. The Eighth Report of the Select Committee on National Expenditure which has just been published (H.M. Stationery Office) examines the working of the scheme to date and recommends that greater use should be made of the Register for recruiting professional and technical personnel for war purposes. Altogether 50,000 individual applications for enrolment in the Register have been examined since the outbreak of war, and somewhat less than half these applications have been accepted. In all, the number of persons on the Live Section of the Register on May 20 was 97,044. The report observes that the Register is not, as is often supposed, an organization for finding jobs for men but one for finding men for jobs—a fact which should be given the widest publicity. There are still many people of the highest qualifications who appear not to have realized this and have failed to register. It is of the greatest importance that they should do so. The sub-committee responsible for the report considers it essential to make a complete and therefore compulsory register of persons in categories which are, or are likely to become, scarcity categories of the Central Register. Also, Government departments should assist the Central Register to function more effectively by presenting their demands for technical staff through a technical rather than an establishment officer, by not requiring full technical qualifications for posts which are primarily administrative, by relaxing their requirements especially in regard to age, and by expediting the notification of appointments.

Since the publication of the report an Order has been made by the Minister of Labour and National Service making the registration of professional engineers compulsory; it also includes engineering research workers at universities. The Order came into force on July 14. Registration with the Central Register must be made this week. Men whose names are already on the Register are not to register again.

The new Order (No. 1221) has been sent by the Secretary of the Institution to all members, other than students, who have not already enrolled in the Register. The position to date is that more than 75% of the members have enrolled voluntarily through the Institution, while a number, not included in the 75%, have enrolled through some other professional body. The new order requires registration for all professional gas engineers who, though they may not be members of the Institution, possess training and experience equivalent to those required for membership.

RAPID DEVELOPMENT

IN our news columns to-day we refer to the inauguration at Lincoln of a new 3 million cu.ft. gasholder—another event marking the story of rapid development of the Gas Undertaking since Mr. George Wright was appointed Engineer and Manager just ten years ago. In 1930 increased storage was Mr. Wright's immediate concern, and the following year saw the completion of a holder of a capacity of 1½ million cu.ft. It was in that year, too, that a scheme was put forward for the complete reconstruction of the Bracebridge Works—an extraordinarily well-planned scheme which was brought to fulfilment two years later. The opening ceremony was held in June, 1933, in what we described at the time as a "cheery manner" and as a demonstration of the Lincoln Corporation's "sturdy faith in the future of the Industry." Mr. Wright transformed a congested and largely out-of-date works into one with modern and extremely efficient equipment which quickly proved its economic worth. The scheme, it may be recalled, was rounded off with a most attractively planned garden. The Lincoln Gas-Works became a show place. Large numbers of the public have flocked to see it, which has had a prestige value, but more important, perhaps, has been the effect of the whole reconstruction, with its buildings of good design conveniently grouped, on the minds of those employed in the works. They have become what may be termed "works proud."

Year by year improvements and extensions were put in hand—benzole recovery plant in 1934, followed by new carbonizing plant, the laying of mains to additional areas. New business was sought in a spirit of lively enthusiasm and gained to the lasting satisfaction of the consumer. Since 1930 sales have increased from 521 to 869 million cu.ft.—a matter of 65%; the length of mains has grown from 93 to 143 miles; the number of consumers from 17,000 to over 20,000; the amount of gas used in industry now represents 34% of the total sales. All of which is an excellent record of the results of energy and drive.

THE BRIGHTER SIDE

SOME few days ago, *The Times* had a leading article extolling the virtues, at a time like the present, of letter-writing of the right kind, as forming a most effective tonic. The writer urged that "the pen used for the simple business of letter-writing can be probably a mightier, and certainly a more useful, weapon than the sword." To be of the right kind, he went on, the letter "must be cheerful. No one could wish it to have a forced pretence of gaiety—the most intolerable of qualities—but so far as it deals with public events at all, it will look on their brighter side." Much further good advice is offered, in the inimitable style of our contemporary, so welcome in its "last editorial"; and this advice should be followed, for truly, as is said, the enemies which such a letter as is envisaged will fight are fear and depression.

But this habit of "looking on the brighter side" may advantageously be cultivated beyond the realms of friendly correspondence, and we would suggest that there exist the most solid grounds for such cultivation in connexion with the affairs of the Gas Industry, without falling into any error of a "forced pretence of gaiety." Matters will mend, and when they do so gas undertakings will assuredly be among the first of our commercial businesses to stage a strong recovery. If we cannot dissolve existing difficulties, we can stand up to them—and we can be cheerful. Let us keep our gaze fixed steadfastly on the brighter side, availing ourselves of every opportunity of seeing this side. One method of doing this, it may be suggested, is by carefully studying the reports of operations of gas undertakings appearing periodically in the pages of the "JOURNAL." Always of great value as indicative

of the position and progress of one of the Nation's greatest public services, the extended reports which we are enabled to publish of Gas Company Meetings may be regarded as of particular importance at the present juncture, when "looking on the brighter side" is so essential.

On a later page of this issue of the "JOURNAL" will be found the address of Major Julian Day, the Chairman, at the Annual General Meeting of Gas Consolidation, Ltd., and readers should find this distinctly heartening. It is true, of course, that the period covered by the statistics does not wholly reflect war conditions, but part of the twelve months was affected by the war, and the whole by unsettled circumstances. As we have said, however, these are temporary influences, and taking the long view it would be hard indeed to find anything in the remarks of Major Day to induce other than a feeling of complete confidence in the future—that future when the sword shall once again be exchanged for the ploughshare.

Air Raid Precautions

The manufacturers of carbonizing plant have performed a good service in issuing to users of their plant recommendations in regard to plant operation on receipt of an air raid warning. We have before us the suggestions circularized by West's Gas Improvement Company, Ltd.—a most helpful statement regarding the running of Glover-West vertical retorts in such circumstances. It is yet another example of the endeavours made by the plant manufacturers to ensure smooth working and to co-operate to the full.

Sulphate of Ammonia

The Sulphate of Ammonia (Charges) (No. 1) Order made by the Treasury gives the Treasury power to recover, in connexion with any scheme of control, charges occurred in that control. Under the Order any producer of sulphate must recoup the Treasury on all deliveries of 2 cwt. or over of the material for use as fertilizer sums ranging from £1 2s. 9d. per ton for quantities of 6 tons or more to £2 2s. 9d. for deliveries under a ton. Ammonium sulphate makers who use the material for incorporation in fertilizer mixtures are required to pay £1 2s. 9d. for each ton so used.

Moratorium Plans

Householders who leave areas declared to be evacuation areas under the new Defence Regulations will not be required to pay rents, rates, water, gas, electricity, and telephone charges in respect of their locked-up homes. The Order, issued last Thursday, also states that no sum will be recoverable during the evacuation period under any contract for hire or hire-purchase of goods by a person who, in the case of goods used solely for the purpose of a business, has ceased to carry on the business in an evacuation area, or, in any other case, has ceased to live in the area.

Toluene Control

Control of Toluene (No. 2) Order has superseded No. 1 Order made in 1939. The Order (S.R. and O., 1940, No. 1150; H.M. Stationery Office, 2d.) covers toluene, toluole, and any material containing more than 2% by volume of toluene. The Schedule to the Order gives the maximum basis price of nitration toluene complying with the No. VII (1929) Specification of the National Benzole Association as 2s. 5d. per Imperial gallon. The price is for material delivered at the seller's premises in lots of not less than 10 tons filled by the seller into containers (provided by the buyer) of not less than 10 tons capacity each, and for payment within 30 days. For 90's toluene to the No. VIII (1929) Specification of the National Benzole Association with a toluene content of 72%, the basis price is 1s. 10d. For 90's toluene of this Specification with a toluene content other than 72%, the price is 1s. 10d. per gallon with an addition at the rate of $\frac{1}{8}$d. for every 1% of toluene content above 72% or a similar amount deducted for every 1% of toluene content below 72%. For the purpose of fixing the maximum price, the excess paraffin content is to be taken as that shown in a table, given in the Schedule, connecting paraffin content and specific gravity.

Forthcoming Engagements

August.

13.—Irish Association.—Annual General Meeting at Dublin.

24.—Scottish Western Juniors.—Paper by J. Fulton on "Ammonia Recovery."

Captain Richard A. E. Starkey

His many friends in the Gas Industry will learn with regret of the death of Captain Richard A. E. Starkey, a highly esteemed member of the "JOURNAL" staff, which occurred at his home at St. Catherine's Court, Bedford Park, on Saturday, at the age of 45. We at Bolt Court mourn the loss of a beloved colleague, and our sorrow will be shared by a great many gas plant manufacturers, engineers, and managers with whom he came into contact during his 21 years' work in the Gas Industry.

Captain Richard A. E. Starkey

Born in Leicester and educated at Wyggeston Grammar School, Captain Starkey had a wide experience in the engineering world before he entered the service of Humphreys and Glasgow, Ltd., whom he joined as manager of their transport department on demobilization at the end of the Great War. In that War he served in the ranks from August, 1914, to June, 1915, and in the latter year, as a sergeant in the 13th London (Kensington) Regiment, he won the D.C.M. In June, 1915, he was commissioned to the 3rd/4th Royal West Kent Regiment, commanding a Company at home and overseas for two years ,and being appointed Adjutant of the Reserve Battalion (T.F.) of the Regiment in 1918. After 13 years' service with Humphreys and Glasgow, Ltd., he was welcomed eight years ago on to the staff of the "JOURNAL," and he brought to bear on his activities here, as he had on his earlier work, a keen attention to detail, a persistence that would not take "No" for an answer until the last round of his persuasive ammunition had been shot, and a charm of manner that made him a welcome visitor wherever he called. Indifferent health during the past two years had deprived him of opportunities of moving among his business friends, but he maintained every activity that his diminishing strength would allow up to the end; in fact, less than 24 hours before he died he was busy working out an advertising scheme with his colleagues.

In journalism one becomes hardened to writing obituary notices, but there are times when the poignancy of bereavement comes right home, and this is one of those occasions. A more loyal man never lived, and although his colleagues knew that he was not likely to be restored to health, the news of his passing came like a family blow. He carried into his business life the same fighting spirit that had carried him with flying colours through four years of war, a fighting spirit that never made him displeasingly aggressive but rather made him the more lovable to everyone with whom he came in contact and surrounded him with a host of friends and not a single enemy. He fought bravely against his failing health, and his cheerful disposition made every contact with him a tonic to those who knew him most intimately. As month followed month since his illness had confined him to his home there was never any falling off in the friendliness of his business friends, and everywhere on his territory there were sympathetic enquiries about his progress. Married in 1926, he leaves a widow to mourn his loss.

The funeral service at the Mortlake Crematorium on Tuesday afternoon was attended by all his available colleagues and a large number of his personal friends. A. C. C.

NATIONAL GAS COUNCIL

Meeting of Central Executive Board

A MEETING of the Central Executive Board of the National Gas Council was held at Gas Industry House on July 9. Mr. G. Dixon was duly voted to the Chair, and he thereupon moved the re-election of Sir David Milne-Watson as Chairman of the Board for the ensuing year. This was seconded by Sir Frederick J. West and carried unanimously.

Sir David thanked the Board for his re-election and promised to do all he could for the Council during the difficult times through which the Industry was passing. The Chair was then vacated by Mr. Dixon and occupied by Sir David Milne-Watson.

Sir David moved the re-election of the following Vice-Chairmen: Mr. William Cash, Mr. Frank Jones, Alderman J. H. Lloyd, Mr. G. H. Kitson.

This resolution was seconded by Mr. Carmichael and unanimously adopted.

Postponement of General Meeting

It was reported that a communication had been sent to members of the Board asking for their views as to the postponement of the Annual Meeting, and, no objections having been raised, formal notice of postponement had been sent to members on May 27.

The resignation of Mr. Lees, who had served as a member of the Board since 1919, was received with great regret, and it was decided that a letter should be sent expressing to Mr. Lees appreciation for the services he had rendered. It was reported that the vacancy caused by the resignation of Mr. Lees had been filled by the appointment of Mr. E. Crowther, Chief Engineer and Assistant General Manager of the Newcastle-on-Tyne and Gateshead Gas Company.

The Chairman welcomed Mr. F. C. Briggs, of Dudley, who had been appointed to the vacancy caused by the resignation of Mr. C. H. Webb, and also Mr. C. C. Walmsley, of Sunderland, who had been elected in the place of Mr. C. Rhodes Armitage (retired).

Coal

It was reported that the coal position in the country had now become noticeably easier, and that gas undertakings were building up stocks. Certain other matters relating to the coal position were discussed at length, and resolutions passed to deal with the various matters in an appropriate manner.

Full discussion took place on war damage compensation and damage to appliances, and steps to be taken thereon were agreed upon.

The Courts Emergency Powers Bill widens the scope of the Courts Emergency Powers Act, which provides that no judgment should be executed or proceedings levied for distress or the taking possession of property except with the consent of the County Court. An amendment was moved in Parliament to this Bill, which would have made it necessary for Public Utility Undertakers to apply to the County Court before cutting off the supply to any consumer.

It was reported that the National Gas Council, together with other Associations of the Conjoint Conference of Public Utility Associations, had taken action in the matter, and that it was satisfactory to note that the Bill had been passed without the inclusion of the amendment in question.

Purchase Tax

It was reported that the proposed purchase tax was intended to be imposed on the wholesale value of all goods purchased from a "registered person" selling as such, unless the buyer is a "registered person" buying as such. Certain classes of goods were to be exempt from the tax, including (a) fuel, solid, liquid and gaseous; (b) electricity; (c) gas for lighting purposes.

[It is considered likely that the Purchase Tax Bill will be dropped, and that the tax itself will figure in a modified form in the forthcoming Budget as a luxury tax.]

Members of Central Executive Board

Following is a list of members of the Central Executive Board appointed and nominated respectively by the District Executive Boards and associated bodies as approved at the meeting:

Chairman.—Sir David Milne-Watson, Bart., LL.D., D.L.

Vice-Chairmen.—Wm. Cash, F.C.A., J.P., F. H. Jones, M.Inst.C.E., M.I.Mech.E., J.P., G. H. Kitson, Alderman J. H. Lloyd, M.A., J.P.

Hon. Treasurer.—Alderman Sir Wm. Kay, J.P.

Trustees.—Alderman J. H. Lloyd, M.A., J.P., Alderman John E. Daw, J.P.

Eastern District.—B. Clarke (Stamford), G. A. Mallett (Ipswich), R. G. Shadbolt (Boston), and J. H. Troughton (Newmarket).

Irish District.—Capt. Geo. Anderson (Queenstown), W. J. Grey, A.C.A. (Alliance and Dublin), J. McNicholl (Cork), and J. D. Smith, M.Inst.C.E., J.P. (Belfast).

London District.—R. W. Foot (Gas Light and Coke Company), W. Grogono (Croydon), F. H. Jones, M.Inst.C.E., M.I.Mech.E., J.P. (Wandsworth), and H. C. Smith, M.Inst.C.E., J.P. (Tottenham).

Manchester District.—E. Astbury (Liverpool), J. H. Cadman (Manchester), E. Parry (Oldham), and S. Tagg, M.Inst.C.E., J.P. (Preston).

Midland District. — C. M. D. Belton, A.M.Inst.C.E., A.M.I.Mech.E., F.C.I.S. (Shrewsbury), F. C. Briggs, A.M.Inst.C.E., A.M.I.Mech.E. (Dudley), R. J. Milbourne, F.C.S., A.M.Inst.C.E., J.P. (Wellington, Salop), and A. W. Smith, F.C.I.S. (Birmingham).

Northern District.—J. R. Bradshaw, B.Sc. (Eng.) (Hartlepool), E. Crowther, M.Eng., A.M.Inst.C.E. (Newcastle-on-Tyne), T. P. Ridley, F.C.I.S. (Newcastle-on-Tyne), and C. C. Walmsley, F.C.I.S. (Sunderland).

Scottish District.—G. Braidwood (Coatbridge), T. W. Harper (Ayr), J. Jamieson (Edinburgh), and H. G. Ritchie, A.M.I.Mech.E. (Falkirk).

Southern District.—T. Carmichael, M.Inst.C.E., M.I.Mech.E. (Portsmouth and Gosport), Wm. Cash, F.C.A., J.P. (Bournemouth), A. Valon, M.Inst.C.E. (Bexhill-on-Sea), and S. E. Whitehead, B.Sc., M.I.Mech.E., J.P. (Southampton).

South Wales District.—Wm. Clark Jackson, M.I.Mech.E. (Neath), W. H. Johns, M.I.Mech.E. (Swansea), J. Prosser Jones (Rhymney and Aber), and H. D. Madden, M.Inst.C.E. (Cardiff).

South-Western District.—W. E. Dean (Exmouth), S. J. Ingram, M.Inst.Gas E. (Truro), Col. R. L. Norrington, C.M.G. (Plymouth), and R. Robertson, M.Inst.C.E. (Bristol).

Yorkshire (W.R.) District.—H. E. Bloor, B.Sc., B.Eng. (York), J. E. Lister Cooper (Yeadon), A. L. Jennings (Spenborough), and C. S. Shapley, M.I.Mech.E. (Leeds).

Representing the British Commercial Gas Association.—R. Halkett, Ald. E. Grimsley, J.P., S. Lacey, B.Sc., M.Inst.C.E., Sir David Milne-Watson, Bart., LL.D., D.L.

Representing the Gas Companies' Protection Association.—R. J. Auckland, F.C.I.S., F. G. Brewer, D. H. Helps, A.M.Inst.C.E., Wm. Phillips.

Representing The Institution of Gas Engineers.—G. Dixon, B.Eng., M.Inst.C.E., R. Robertson, M.Inst.C.E., J. Terrace, M.Inst.C.E., Sir Frederick J. West, C.B.E., M.Inst.C.E., J.P.

Co-opted Members.—Col. W. Moncrieff Carr, O.B.E., T.D., United Kingdom Gas Corporation, Ltd., E. V. Evans, O.B.E., F.I.C., South Metropolitan Gas Company, W. J. Sandeman, J.P., Croydon Gas Company.

Letter to the Editor

Helping the National Effort

SIR,—The Scrap Iron and Steel Campaign has called for a ruthless clear out of everything that is not likely to be used until after the war, and no one will doubt that all sections of the Gas Industry will respond loyally to the appeal contained in Major H. E. Crawfurd's letter and your own editorial comment in the current issue of the "JOURNAL." Such response will be limited only by the necessity for maintaining the Industry's essential services, a limitation which implies that nothing is to be gained by scrapping anything useful that has to be replaced by new products involving the use of new metal. This applies particularly to components of fairly modern cookers and other appliances such as linings, crown plates, splashers, door panels, geyser shelves and lamp reflectors.

Many large gas undertakings have long since recognized the advantages of having these components re-enamelled, and one important provincial undertaking alone has had nearly 100,000 linings renovated since 1936. Some medium, and a good many small, undertakings, on the other hand, have so far neglected such means of economy. To measure their contribution to the national effort by the tonnage of these items placed on the scrap heap is to form an entirely misleading impression, for while they may be placing a heap of material at the disposal of the salvage department they are constantly calling for new metal for replacements. However desirable this may be in peacetime, it is a bad policy to-day, when not only the material but the labour involved is so urgently wanted for other purposes.

Despite transport difficulties the vitreous enamelling industry is still able to render useful service by its process of reconditioning components, and gas engineers can help in the national effort and at the same time save money by keeping a watchful eye on the scrap heap. One is prompted to put these points before your readers not by any selfish motives but by a belief that an unprecedented opportunity has arisen for helping the Industry in a time of exceptional crisis. The process of renovation has been developed over a period of years and as the result of extensive research the knowledge thus gained is now at the disposal of the Industry to help it to maintain that high standard of service for which it is world famous.

Yours, &c.,
W. HERBERT COOPER,
Director.

Grosvenor Utilities, Ltd.
Bromley, Kent.
July 12, 1940.

NEWS OF THE WEEK

The Calorific Value of the gas supplied by the South Metropolitan will, on and after Aug. 5, be 530 B.Th.U. per cu.ft. in place of the present declared value of 560 B.Th.U.

Students of The Institution of Gas Engineers who have taken the Higher and Diploma Grade Examinations in Gas Engineering (Manufacture) and (Supply) this year, are informed that, except in special cases, no Oral Examinations are being held this year.

The Acquisition of the Burton Latimer Gas Company is the principal provision of a Special Order for which the Kettering Gas Company intend to apply to the Board of Trade under the Gas Undertakings Acts, 1920-1934. According to the latest returns, the Burton Latimer undertaking has an output of about 24 millions and serves approximately a thousand consumers.

The Mayor of Birkenhead paid an official visit last week to the Birkenhead Gas-Works, which this year will celebrate its centenary. He congratulated Mr. J. Hood, the Engineer and Manager, and his staff on the efficiency of the Department. He said the works were established by a company on a small site which now forms part of the present works. That company which also at the time controlled the town's water supplies, continued to operate until 1859, when the whole concern was purchased by the Birkenhead Improvement Commissioners, the predecessors of the Town Council. In 1881 the two Departments, which in 1877 had come under the control of the Town Council, were separated. The net debt outstanding at the present time was only £437,800.

Ministry of Information

Window Display Scheme

THE Ministry of Information have launched an official window display scheme and are making a strong appeal to all who are able to do so to devote a showroom window to a national message. The Ministry attach considerable importance, especially at the present time, to the showroom window as a means of maintaining public interest and morale, and desire to make this a medium for presenting salient points of public policy to the population.

The scheme consists of the display of a theme in support of which the Ministry provide a free poster, suggested slogans, and enlargements of photographs. A Bulletin on each theme will be issued by the Ministry at fortnightly intervals and will appear ten days before the change of theme is to take place.

By arrangement with the Ministry, future Bulletins will be issued to members requiring them, through the B.C.G.A. The Association will provide assistance to members in displaying this scheme by offering the Ministry's suggestions in a completed form. Future Bulletins will also be accompanied by suggestions from the Association.

The Ministry specially request that all displays should be carefully arranged and so maintain the prestige of the scheme. Those undertakings already taking the Studio's new display scheme will have the Ministry's poster embodied in it. It is felt that as this is a matter of public concern and national interest, undertakings will wish freely to co-operate.

Publicity for Wartime Food Economy

"Gert" and "Dais" at Dudley

IT will be recalled that "Gert" and "Daisy" recently broadcast short food economy talks. They were at the Dudley variety theatre recently, and the Ministry of Food offered their services to the Local Authority to assist in the Food Economy Campaign. The responsible sub-committee of the Local Authority asked the Dudley, Brierley Hill and District Gas Company and the Electricity Company to organize this for them, and the following arrangements were made.

The main assembly hall of the new local Technical College was secured. The Gas Company and the Electricity Company each had a cooker and table on the platform, which was suitably decorated with plants by the Parks Superintendent. By arrangement with "Gert" and "Daisy" the programme was drawn up, by which they opened the proceedings with a short talk left to their discretion. This was followed by a demonstration of the preparation and cooking of a dish by the Gas Company's demonstrator and the Electric Company's demonstrator alternately. There was another talk by "Gert" and "Daisy" in the middle and one at the end.

A raffle was arranged to dispose of the cooked food at the end of the demonstration. Tickets were sold at 2d. per head for this purpose, and there were ten cooked food prizes. "Gert" and "Daisy" drew the numbers for the raffle.

From the point of view of publicity for wartime food economy, the whole arrangement was a huge success. Over 650 persons were present, and over £4 15s. was obtained by raffle for the local Townswomen's Knitting Depot providing comforts for the troops. The demonstrator for the Gas Company was Miss Hearn, of Radiation, Ltd.

British Commercial Gas Association

Wartime Policy

THE radical change in the war situation during the past week or two, with its important influence on the future, rendered it desirable that the B.C.G.A. should reduce to the minimum the need for members to leave their districts for the purpose of attending meetings in London. With this in view the Executive Committee have decided that until further notice the control of the Association should be vested in the Emergency Executive Committee consisting of the following members:

Mr. W. J. Sandeman	Chairman.
Major F. J. Bywater	Vice-Chairman.
Mr. A. W. Smith	Past Executive Chairman.
Mr. T. Brown	Honorary Treasurer.
Mr. Stephen Lacey	Chairman, Finance Committee.
Mr. J. Boxhall James	Chairman, Publicity Committee. Chairman, General Services Committee and Chairman, Manchester District.
Mr. J. H. Cadman	Acting Chairman, Manchester District.
Mr. D. Fulton	Chairman, Scotland.
Mr. T. P. Ridley	Chairman, Northern District.
Mr. H. Singleton	Chairman, Yorkshire District.
Mr. F. C. Briggs	Chairman, Midland District.
Mr. H. D. Madden	Chairman, South Wales District.
Mr. W. C. Chapman	Chairman, Eastern District.
Mr. C. Valon Bennett	Chairman, Southern District.
Mr. R. C. Taylor	Chairman, South Western District.
Mr. H. W. Saville	Chairman, Ireland.
Mr. Cyril G. Davis	S.B.G.I.

No Further Advertising

At a recent meeting of this Committee it was decided that it would not be in the national interest, in present circumstances, to proceed with national advertising in the Press, and no further contracts for space will be placed until further notice. It is of interest to note that the Electrical Development Association has decided to follow a similar policy on behalf of the electrical industry. A few of their advertisements will continue to appear during the next two weeks until the space contracts have expired or can be cancelled.

The B.C.G.A.'s staff was considerably reduced after the outbreak of war and further reductions have now taken place owing to certain officers being seconded to Government Departments and also to men being called up for military service. A small nucleus staff remains, however, in each department to deal with the requirements of members as they arise in connexion with films, posters, literature, local advertising, display material, and general information. These services will continue to be available to members and so that they conform, first, to national interests and, secondly, to the spirit of the Joint Gas and Electricity agreement, touch will be maintained with the Electrical Development Association upon these matters.

The arrangements outlined above will considerably reduce the Association's annual expenditure, and the proportion of the joint subscription to be refunded at the end of the current financial year will be correspondingly increased.

War Emergency Standards

It is appreciated that the difficulties resulting from the war conditions, render it impossible for manufacturers in certain cases to adhere strictly to all the requirements of existing British Standards.

It has been brought to the notice of the British Standards Institution that trade organizations are sometimes obliged, on account of the urgency, to take steps to secure general agreement to contract out of the existing B.S. specification requirements. The machinery of the British Standards Institution has been adapted to enable War Emergency Revisions or the preparation of War Emergency Standards to be put through with a minimum of delay—in some cases merely a matter of a few days.

The War Emergency Standards (or Revisions) are being issued in a distinctive form (on yellow paper) so as to avoid confusion with the general B.S. standards, and it is also being made clear, whereever necessary, that such standards or revisions only apply to the home market and not to the export trade, and can be modified again when peace comes. A number of such war revisions bringing about the necessary co-ordination have already been issued and others are being prepared.

It should be noted that in this work the British Standards Institution is receiving the full co-operation of the appropriate Government Departments who are frequently the users most directly concerned, and they welcome the issue of these War Emergency Standards where such are found necessary.

If any member of The Institution of Gas Engineers has difficulty in obtaining materials to British Standards Institution specifications, would he communicate with the Secretary of The Institution of Gas Engineers, who will be pleased to take the matter up with the British Standards Institution.

New Gasholder Inaugurated at Lincoln

Tuesday of last week saw the inauguration at the Bracebridge Works of the Lincoln Gas Department of a new four-lift spiral-guided gasholder erected by Newton Chambers & Co., Ltd., of Thorncliffe Ironworks, nr. Sheffield. The new holder has a capacity of 3 million cu.ft. and is constructed of mild steel in a steel tank 180 ft. in diameter by 34 ft. 7 in. deep, containing 5½ million gallons of water and weighing 24,215 tons.

The carriage rollers are of cast steel with turned steel axles, oil bath lubricated and dust proof. The total pressure thrown by the holder is 15.8 in. w.g., the weight of the four lifts aggregating 818 tons. Other contractors concerned in the work were as follows: Design of foundations, F. C. Construction Co., Ltd., of Derby; foundation work at site, M. Otter & Co., Ltd., of Lincoln; excavation, B. Gunley & Co., Ltd., of Brentford.

The inauguration ceremony was performed by the Mayoress of Lincoln (Mrs. A. L. Bower), whose husband, the Mayor, is chairman of the Gas Committee.

To commemorate the occasion, the Mayor unveiled a tablet, while Major W. Kitching (General Manager of the Ironworks Department of Newton Chambers & Co., Ltd.) presented a silver tea service to the Mayoress. A further presentation was made to the Mayor by Mr. G. Twist (Distribution Superintendent) on behalf of the staff of the Gas Department.

Mr. W. C. Chapman (Engineer and Manager of the Boston Gas Light & Coke Company) proposed "The City of Lincoln Gas Department," and observed that another milestone was that day being placed in the gas undertaking of the City. He referred to the remarkable progress of the undertaking and to the increasing sales of gas.

Coun. J. W. F. Hill, who replied, said that the progress made since 1931 was largely due to Mr. G. Wright (the Gas Engineer), and the Mayor, who was Chairman of the Gas Committee.

The Mayor, proposing a vote of thanks to the Contractors, spoke of the difficulties experienced by bad weather and in the securing of materials. Major Kitching replied.

Spanish Handbook on Industrial Practice

A B.S.I. Publication

The B.S.I. is engaged on the compilation of a technical Handbook in the Spanish language, the object of which is to make known to prospective purchasers in South America what British industry has to offer. It will also bring British industrial practice prominently to the attention of importers, salesmen, young engineers, and others, and correct any misapprehension which may exist regarding the competitive character of British goods and their suitability to those markets.

The British Council is lending its full support to this effort and will assist in giving publicity to the Handbook and in furthering its distribution throughout the whole of South America.

A Committee of Direction under the chairmanship of Dr. T. Swinden, of the United Steel Companies, Ltd., composed of a number of experts, which was set up to examine the project, unanimously decided that the Handbook should cover all those branches of industry interested in South American trade. It will be the forerunner of other volumes dealing in far greater detail with individual industries, which will be undertaken at a later date when the technical staffs are able to turn their attention from matters relating to the war effort.

A Supplement to the Handbook is being prepared which will give British exporters an opportunity of bringing to the notice of South America, through textual and display advertisements, their own particular products. The Supplement will be given away with each copy of the Handbook sold.

The B.S.I. has circularized trade organizations and export groups likely to be interested, but any individual firms who have not up to the present received details of the project, if interested, are invited to communicate with the Institution at 28, Victoria Street, London, S.W.1.

CHELTENHAM COLLEGE ADOPTS CENTRALIZED CATERING

A View of the Kitchen

THE accompanying photographs show the modern catering equipment which has lately been installed at Cheltenham College. At the outbreak of war the College evacuated to Shrewsbury, but it was subsequently decided to return to Cheltenham. As part of the re-organization of the arrangements it was considered opportune to inaugurate central catering in place of the previous system of taking meals at individual houses.

In order to provide a dining room capable of seating some 450 to 500 boys and masters the library was moved to another part of the College and the library building—formerly the Chapel—was converted into a dining hall. The original science laboratories and classrooms became the kitchen and subsidiary service rooms, stores, &c., the whole installation being very compact and designed to obviate unnecessary movement on the part of the kitchen staff. An interesting feature of the equipment is the cafeteria self-service counter from which "orderlies" from each table collect the plates, dishes, and so forth and carry them to the masters in charge of the tables to be served to the boys. The used crockery is removed by the "orderlies" to specially constructed trolleys—so that the whole service is run without the use of waiters or waitresses.

All the cooking and service equipment is gas-heated and includes a 4-oven range, two 25-gall. vegetable boilers, a 25-gall. porridge boiler, three steaming ovens, a 2-pan fish-fryer, stock-pot stand, and, in the service section, a bulk tea-brewer, a gas boiler, and 4 hot-closets.

Attention has been paid to the wartime need to carry considerable bulk stores, and the cold room is an extensive and fully effective installation. It is completely enclosed with brick walls and has a storage capacity of 650 cu.ft.

A highly efficient system or artificial ventilation has been installed. The whole of the catering and service operations work smoothly and efficiently under this system, and it is anticipated that the installation may well become a model for other schools and colleges which are re-planning their catering arrangements.

The Contractors for the supply and installation of the whole of the equipment were Ash's Manufacturing Co. (Blackfriars), Ltd. The Builders responsible for building alterations and plumbing

The Cafeteria Self-Service Counter

work were Messrs. Holborow, Ltd., of Tetbury, Glos., and the Electrical Contractors, Messrs. G. W. Franklin & Son, Fitzroy Square, W.1. The gas supply installation work was carried out by the Cheltenham and District Gas Company, and the ventilation work by Messrs. James Coombe, Carlisle Street, N.W.9.

STANDBY LOSSES OF WATER HEATERS

IN the "JOURNAL" of July 3 we gave a summary of the findings of a Committee of the America Gas Association resulting from an investigation on domestic gas water heating. The work was reported in A.G.A. Bulletin No. 9. The following, abstracted from the Bulletin, deals with the standby losses of water heaters.

In evaluating over-all gas consumption required to heat water with automatic storage type heaters, one of the important considerations is the amount of heat required to maintain stored water at a predetermined and usable temperature. This heat requirement is usually termed standby loss and is generally expressed as a percentage of the heat content of the stored water above room temperature. In the Bulletin the term "standby loss" is used to indicate the heat input required to compensate for all heat losses occurring during a standby period, while percentage standby loss is this heat input expressed as a percentage of the stored heat content. Standby loss is probably a larger percentage of the total heat needed for average hot water requirements than is ordinarily appreciated. For example, a typical A.G.A. approved water heater, having a 20 gall. storage vessel and an input rate of 25,000 B.Th.U. per hr. and delivering 50 to 60 gall. of hot water per day, will require approximately $\frac{1}{3}$ of the total monthly gas consumption to maintain stored water at a usable temperature. If only 30 gall. per day are drawn, this same heater will require about 50% of the total gas consumption for maintenance of stored water temperature. Means of reducing standby losses, therefore, constitutes one of the most attractive fields for improvements of overall efficiencies of automatic storage type heaters.

Included are new data on the effect on standby loss characteristics of variations in pilot rate and of reducing circulation of air through heater flues during periods when the main burner is not operating. In addition, effect of main burner input rate, stored water temperature, and storage vessel size and shape on standby losses are discussed.

Pilot Gas Rate

Eleven automatic storage gas water heaters equipped with thermostatic pilots were employed in this phase of the investigation and are briefly described in Table I. While these heaters do not include all types and sizes of automatic storage heaters available they are sufficiently representative to support generally applicable conclusions. For example, normal gas input rates varied from 5,000 to 45,000 B.Th.U. per hr. and storage vessel capacities from 15 to 42 gall. In addition, internal flue, external flue, and revertible flue types of underfired heaters, as well as a side-arm type externally-fired heater, were included among the models selected.

TABLE 1

DESCRIPTION OF HEATERS EMPLOYED

Heater.	Input Rate B.Th.U./Hr.	Storage Vessel Capacity, Ga..	Type of Heater.
A	25,000	30	Underfired, internal flue.
B	20,000	20	" internal "
C	25,000	30	" revertible "
D	16,000	15	" internal "
E	20,000	20	" internal "
F	45,000	42	side-arm
G	20,000	20	" internal "
H	30,000	20	" internal "
I	35,000	30	" external "
J	15,000	20	" internal "
K	5,000	30	" internal "

Each of the 11 heaters employed in these studies was installed and subjected to standby loss tests outlined in Sec. 19, Part II, of the current American Standard Approval Requirements for Gas Water Heaters except that pilot rates were adjusted to predetermined values instead of "within the limits as specified by the manufacturer" as stated in these requirements. At least two standby loss tests were conducted on each heater at each pilot rate adjustment for purposes of corroboration. Check tests were required to agree within 5%.

On Heaters A to F inclusive standby loss tests were conducted at several pilot input rates ranging from three input rates with Heaters E and F to six on Heater A. In certain cases, Heaters B, D, E, G, and H. maximum pilot rates were selected which were adequate to compensate for heat losses from the storage vessels at the initial stored water temperature. Under such adjustments the stored water temperature was maintained or in some cases increased by the pilot input alone and without operation of the thermostat or main burner. In other cases, pilots on Heaters E and F were intentionally over-adjusted at the maximum pilot rate so as to produce excessive flame impingement on metal surfaces with resultant deposition of carbon.

An additional series of tests was conducted on two heaters to determine efficiency of heat transfer at pilot rates. On each heater stored water temperatures were determined by means of five thermocouples equally spaced on a vertical axis through the storage vessel. The stored water was then brought to approximately 165° F. and maintained at this temperature until equilibrium temperature conditions were attained. All gas to the heater was then shut off and temperatures of the stored water determined at 10 min. intervals for a total cooling cycle of 4 hr. A similar procedure was followed except that the pilot burner was operated continuously during the cooling cycle, different pilot gas rates being employed on successive tests. From these temperature data total heat losses were calculated for each condition of test.

Results obtained during this investigation are summarized in Table 2. These data indicate conclusively that for any heater studied there were no significant changes in standby loss for variations in pilot rates except in the cases of Heaters E and F where at the excessive pilot rates employed standby losses increased. However, in these two instances, pilot flames impinged and heavy carbon deposits were produced on the safety pilot thermal elements at the maximum input used. As a result of this impingement combustion of the pilot gas during the two cases involved was incomplete as evidenced by carbon deposition. Accordingly, heat energy of the fuel was not fully utilized and standby losses increased.

Neglecting the two special cases of over-adjustment on Heaters E and F all other data show that standby losses were not affected by variations in pilot rate. As will be noted from Table 2, pilot rates of several heaters (B, D, E, G, and H) were adjusted to a point where the thermostats did not cycle, or, in other words, where sufficient heat was liberated by the pilots to maintain stored water at or above temperature settings. In such cases the total gas input required during the standby period to maintain higher stored water temperatures correspondingly increased. Thus, as would be expected and as may be verified from data in Table 2, overall gas consumptions required to maintain a convenient supply of hot water increased as the difference between temperature of stored water and room temperature was increased. A compensating factor, however, as will be seen from Table 2, was that the heat content of the stored water also increased, this increase in heat content being about proportional to the increase in total gas consumption during standby with the net result that standby losses (expressed as percentage of heat content of stored water above room temperature) were not appreciably affected. Thus, while it would not be generally desirable to increase a pilot rate above that necessary to maintain stored water temperature at a predetermined setting, it seems evident from the data presented that such a limiting rate may be exceeded, at least slightly, without increasing standby loss.

In view of the wide range of pilot input rates employed on each heater and since the heaters used differed greatly in size and design, it seems reasonable to assume that results could be considered as being generally applicable. However, in order to determine more

TABLE 2

SUMMARY OF DATA ON PILOT RATES AS THEY INFLUENCE STANDBY LOSS

Heater.	Pilot Gas Rate B.Th.U/ Hr.	Room Temp. °F.	Average Stored Water Temp.°F.	Stand-by Loss %/Hr.	Average Total Gas Input during Stand-by B.Th.U./Hr.	Heat Content of Stored Water above Room Temp. B.Th.U.
A	99	74.2	149	5.22	955	18,280
	290	72.2	147	5.11	936	18,310
	341	69.7	143	5.30	941	17,270
	450	71.5	146	5.06	922	18,200
	597	71.9	146	5.11	930	18,200
	657	70.5	148	5.04	957	18,950
B	174	73.2	148	6.20	726	11,700
	254	76.2	144	6.27	659	10,500
	340	74.5	145	6.21	675	10,870
	536	85.3	148	6.28	615	9,790
	710†	85.8	157	6.41	710	11,070
C	198	78.1	144	6.41	981	15,300
	274	73.8	142	6.51	1,022	15,700
	389	73.6	140	6.29	963	15,300
	539	77.4	140	6.51	944	14,500
D	334	79.0	134	10.72	778	7,250
	390	74.0	135	10.40	820	7,890
	442	76.0	135	10.88	836	7,680
	745†	85.2	138	10.72	745	6,940
E	280	81.7	140	6.81	630	9,240
	760	78.0	154	6.89	827	12,000
	*1,097†	76.0	167	7.62	1,097	14,380
F	304	81.0	145	7.61	1,660	21,800
	775	80.8	146	7.97	1,745	21,900
	*1,348	82.2	146	8.93	1,920	21,500
G	165	91.5	142	10.63	850	8,000
	1,000†	88.0	147	10.88	1,000	9,190
H	285	80.0	142	7.23	736	10,180
	837†	81.0	150	7.34	837	11,400
I	225	74.0	151	6.71	1,280	19,100
	690	72.8	153	6.65	1,323	19,900
J	143	83.0	145	6.94	701	10,100
	421	81.0	143	6.97	704	10,100
K	0	76.0	156	4.45	824	18,500
	640†	68.0	127	4.70	640	13,630
	830	72.5	158	4.84	955	19,750

† At these pilot rates thermostats did not cycle since sufficient heat was liberated to maintain stored water at or above temperature setting.

* At these pilot rates combustion was incomplete and carbon was deposited.

conclusively the universality of this behaviour a further study of the problem was made.

Analysis of the sequence of events during a standby period indicates that for any pilot rate below that at which heat liberated from the pilot burner is equal to or greater than heat losses from the system at a predetermined stored water temperature, the main burner must operate for some interval of time during the standby period if the heater is equipped with snap-acting thermostatic control. For example, referring to Heater B in Table 2 it will be found that during the test conducted at a pilot rate of 174 B.Th.U. per hr. the total average gas consumption was 726 B.Th.U. per hr., or, on the average, the main burners necessarily supplied 76% of the heat input necessary to compensate for the total heat losses during the standby period and the pilot supplied the remaining 24%. On the same heater, when tested with a pilot rate of 340 B.Th.U. per hr., the main burner supplied 49.6%, and the pilot 50.4% of the total heat losses. When tests were conducted with a pilot rate of 615 B.Th.U. per hr. the thermostat did not cycle and accordingly no main burner gas was consumed during the standby period. In this case the pilot burner supplied 100% of the total heat losses during standby.

On the basis of analysis of data in Table 2, of which the foregoing is one example, a reasonable explanation for uniformity of standby losses with varying pilot input rates appears to be that heat transfer efficiency with pilot only operating is comparable to that with main burner input supplementing or displacing entirely pilot input rate. In this case it may be noted that during a thermal efficiency test at full main burner input rating the time interval involved is relatively small, since in such tests stored water is heated from room temperature to approximately 150° F., which requires a small period of time for most types of heaters. As a consequence radiation and convection losses from the heater constitute an extremely small percentage of the total heat input. If a similar heating cycle efficiency test is conducted at a pilot rate (sufficiently high to produce a corresponding temperature rise) the time interval involved would be considerable and as a result radiation and convection losses from the heater would represent a very large proportion of the total heat input. Under such test conditions thermal efficiency found for the normal main burner input rate is considerably higher than that for low input rates such as are produced by the pilot burner. However, during a standby period, total convection and radiation losses from a heater are substantially the same regardless of whether such losses are made up by pilot or main burner operation, since the time of the test period is the same in both cases. As a matter of fact, such losses are unquestionably higher with main burner operation due to higher combustion chamber temperatures. Hence, heat losses due to radiation and convection become of minor importance in comparison with actual heat transfer between flame and flue gases and stored water.

In order to determine directly the magnitude of heat transfer at pilot input rates a series of tests was conducted on several heaters. These tests consisted of determining successively on each heater the drop in average stored water temperature with all gas turned off and with the pilot adjusted to various input rates. The difference in rate of temperature drop (or in heat loss which is equal to the product of temperature drop and pounds of stored water) represents the effectiveness of heat transfer from the pilot gas, making the reasonable assumption that heat losses are practically the same under all conditions or slightly higher with the pilot operating. Typical data are shown in Table 3, from which it will be seen that with a pilot rate of 236 B.Th.U. per hr. the rate of heat loss was 616 B.Th.U. per hr. compared to a rate of heat loss of 674 B.Th.U. per hr. when all gas was turned off. The difference of 58 B.Th.U. per hr. represents the portion of the pilot input

TABLE 3

DATA SHOWING EFFECTIVENESS OF PILOT RATES IN MAINTAINING STORED WATER TEMPERATURE

Pilot Rate B.Th.U/Hr.	Average Rate of of Temp. Drop—°F/Hr.	Average Hourly Heat Loss—B.Th.U. (Temp. Drop Times 154).	Efficiency %
0	4.375	674	—
236	4.000	616	24.6
685	2.875	442	33.9
1,225	0	0	55.0

which was effective in compensating for heat losses from the system. This difference divided by the B.Th.U. pilot input rate indicates an efficiency of 24.6%. Similarly, at a pilot rate of 1,225 B.Th.U. per hr., which was sufficient to maintain stored water temperature continuously, the indicated efficiency was 55%. It may be noted at this time that during the standby loss test on this heater, the average hourly B.Th.U. consumption was 1,240 with a pilot rate of 325 B.Th.U. per hr. (74.7% of heat supplied by main burner operation). This is further evidence supporting the theory that effectiveness of the pilot flame alone to maintain stored water temperature is as great as the combined effectiveness of the pilot and main burner flames, or of the main burner operating alone.

Inasmuch as it has been shown that variation in pilot rates do not affect standby losses and since obviously they could have no effect on thermal efficiencies, it follows that service efficiencies would also be free from influence by reasonable variations in pilot rates.

From the foregoing it may be concluded that pilot rates can be adjusted at any point between the following practical limits without materially affecting water heating costs: A minimum practical rate below which gas at main burners cannot be effectively ignited or thermostatic devices will close, and a maximum practical rate above which combustion becomes incomplete, carbon is deposited, or temperature of stored water increases excessively. This conclusion has considerable significance since it indicates that field adjustments which are critically low and which, as a consequence, may lead to hazardous ignition conditions and susceptibility to extinction by drafts or concussions can be avoided in favour of higher adjustments assuring satisfactory ignition and better stability without materially increasing over-all gas consumption.

Circulation of Air Through Heater Flues

The heat lost from storage vessels during standby periods may be segregated into two principal classifications—namely, losses through the flue and through exterior surfaces by radiation and convection. Flue losses, in turn, may be divided into two classes: (1) loss during full-on main burner operation, and (2) the heat lost during the time the pilot only is operating, or when the main burner is operating at some cut-down rate controlled by a graduating thermostat. Design features leading to reduction of flue losses are generally also effective in reducing flue losses occurring during periods of pilot operation or cut-down main burner operation.

Reduction of flue losses during standby periods where effected by mechanical means is usually accomplished through decreasing circulation by closing off secondary air openings or flue outlets, the only limitations on such closure being maintenance of adequate secondary air supply and venting areas for pilot flames or cut-down rates. Closure of flues or secondary air openings during standby periods has generally been brought about by action of a diaphragm valve located between the thermostat and burner orifice and connected by suitable linkage to a flue or secondary air damper.

During this investigation an automatic flue damper was employed to reduce circulation during that portion of standby periods when only the pilot was operating. In all cases some increase in service efficiency resulted from use of the flue damper. Significant aspects of this work are adequately illustrated from data on two of the heaters employed which had widely different flue loss characteristics. Tank capacities and input rates were the same in both instances, being 30 gal., and 25,000 B.Th.U. per hr. respectively. These data are shown in Table 2, from which it will be noted that minimizing circulation during off-burner periods was quite effective in reducing standby losses. As would be expected, Heater A having more effective heat transfer as indicated by lower excess air concentration and flue losses was less affected by the flue damper than was Heater B which had higher initial flue losses. It is interesting to note that with flue dampers, service efficiency of Heater B was comparable to that of Heater A, while without flue dampers service efficiency of Heater A was appreciably higher. Similarly, standby loss which was initially higher for Heater B was reduced by use of a flue damper to a value below that found on Heater A when also operated with a flue damper. This behaviour was probably due to the fact that the ratio of flue to jacket losses was higher on Heater B than on Heater A, and that the combined radiation and convection losses from the jacket (and other surfaces) were lower on the former heater. This indicates that with heaters designed to produce high heat transfer rates at a given input use of any mechanical means to reduce or eliminate circulation during off-burner periods might not be justified, whereas on heaters having relatively high flue losses but with well insulated exterior surfaces use of such means would prove effective and be economically warranted.

Theoretically, as the heat input rate increases potential flue losses during standby periods also increase, since the area of heating surfaces must generally be increased to produce acceptable efficiencies. The reverse of this would also be true. It seems reasonable, therefore, to conclude that flue or secondary air control when the main burner is cut off or cut down would become more effective as the input rate was increased. While insufficient data were obtained to warrant a definite conclusion, it is believed that the results listed in Table 4 are typical of all heaters having input rates within the ranges commonly employed on domestic automatic storage water heating units.

TABLE 4

EFFECT OF RESTRICTING CIRCULATION OF AIR IN FLUES DURING STANDBY WHEN MAIN BURNER IS NOT OPERATING

Heater.	Equipped with Flue Damper.	Excess Air.* %	Flue Loss.* %	Thermal Efficiency. %	Stand-by Loss. %	Service Efficiency, %**
A	No	45	18.2	73.5	6.00	49.6
	Yes	45	18.2	73.5	5.38	51.8
B	No	112	23.6	69.4	7.82	44.2
	Yes	112	23.6	69.4	4.65	52.0

* At normal gas input rate. ** 60 gal. of water per day raised approximately 75°F. for all tests.

Interpretation of results obtained on flue dampers in terms of operating costs may be made by analysis of service efficiency data

provided by Table 4. Thus, to produce 50 gall. of water raised 90° F. fuel consumption on Heater A was reduced by use of the damper to the extent of 180 cu.ft. of 530 B.Th.U. manufactured gas per month. On Heater B the reduction would equal 720 cu.ft. per month.

Main Burner Input Rate

As brought out in the preceding section, trend of data obtained in studies of reducing air circulation during standby periods indicated that as the input rate was increased the effect of the flue damper would become more pronounced. This behaviour was explained by the fact that the capacities of flues to discharge flue gases on well designed heaters are maintained in a rather definite proportion to gas input rates. At high input rates more flue opening is required for the greater volume of flue gases and naturally greater circulation of air though the flues would be expected during standby periods, which would result in greater losses from the flue. The same line of reasoning would indicate that standby losses might be expected to be greater for heaters having high input rates than for equally well designed heaters having low input rates. This was substantiated by comparative tests on several heaters during which the flue baffling was varied to produce the same percentage of excess air at each of the several input rates employed. In every case, standby losses decreased as input rates were decreased.

Another condition should be considered briefly—*i.e.*, the effect of variation in input rate on standby loss for a given heater which is not otherwise changed. Results found for this condition were very erratic, standby losses increasing in some cases and decreasing in others as the input rate was decreased. Hence, the effect which may be expected from such change will depend largely on the type and design of heater involved.

Temperature of Stored Water

Over practical ranges of variations in difference between stored water temperature and temperatures surrounding the heater, gas consumption required to compensate for heat losses during standby decreased in nearly linear proportion to the decrease in stored water temperatures. Standby losses, when expressed as a percentage of the stored heat content, did not change significantly as the temperature of stored water was decreased.

It is recognized that these are practical limits for stored hot water temperatures, the minimum for general usage being approximately 130° F. since a tank temperature of this magnitude is required to provide acceptable hot water temperatures at the fixtures, while the maximum limit for domestic use is generally considered to be in the range of 150° to 180° F., these values being governed by corrosion and liming aspects. Within this comparatively narrow range of temperatures, the gas consumption required to maintain a predetermined stored water temperature varies in nearly linear proportion with temperature.

When performance is interpreted in terms of actual service and overall economy in the field, such as piping losses and customer usage, several other factors must be considered in evaluating effect of variations in stored water temperature. Compensating factors tending to offset increased heat losses during standby produced by higher stored water temperatures are the increase in heat content of water available and the apparent tendency of increased water temperature at the fixtures to discourage wasteful usage. Considering the first-mentioned factor, it is significant to note that during service efficiency tests, comparable results have been obtained on a given heater over a practical range of stored water temperatures, provided that the same volume of water was delivered regardless of variation in stored water temperature. In this case, while service efficiencies were comparable for different stored water temperatures, gas consumptions increased as the temperature of water drawn (a total quantity of heat delivered) was increased. Similarly, service efficiencies were comparable, as the total quantity of heat delivered was maintained constant for varying water temperatures. If it is assumed that the user draws the same quantity of heat, then gas consumptions should remain substantially constant for limited differences in stored water temperature. If it is assumed that the user draws the same volume of water (regardless of temperature), then gas consumptions increase at higher stored water temperatures due not to decreasing efficiencies but to increased heat supplied.

The relationship between wastage of hot water and temperature is a debatable one. It is claimed in some instances that increasing water temperature decreases wastage since the hot water cannot be used flowing from the faucet but must be mixed with cold water to be usable for many purposes. This is mentioned, not for its technical significance but rather to emphasize that collateral factors do affect determination of appropriate water temperatures. In addition to this consideration, high water temperatures are sometimes desired for dishwashing and laundry purposes.

It seems apparent from the foregoing that any temperature setting in the practical range of limits (130°—180° F.) previously indicated should be satisfactory from the standpoints of efficiency and quality of hot water service rendered, although as the data show standby losses increase on heaters when considered alone as stored water temperatures increase.

Storage Vessel Size and Shape

For cylindrical storage vessels having similar proportions, it has been considered that heat consumptions required to compensate for standby losses are proportional to the cube root of the storage vessel capacity. Analysis of data on standby losses and storage vessel capacities of a number of heaters tested for A.G.A. approval shows conclusively that the average trend for all types of automatic storage heaters does follow quite closely the relationship indicated. It may be concluded, therefore, that in general standby losses (expressed as gas consumption during standby period) increase substantially as the tank size is increased. Obviously, standby losses expressed as a percentage of the stored heat content decrease with increasing tank size, since the stored heat content varies directly with tank size while heat losses vary only as the cube root of the tank size.

While the foregoing is sound technically it has little significance from either heater design or heater sizing purposes. As is well recognized, heaters must be designed and selected on the basis of meeting certain hot water requirements. Some latitude may be allowed in tank size for a given installation by suitable proportioning of input rates. This, in turn, complicates the efficiency relationship since the smaller the storage vessel size the higher the input required for a given hot water demand, and service efficiencies decrease as input rates are increased under the same condition of hot water withdrawal. A useful conclusion that can be drawn is that heat losses during standby periods can be minimized by employing as small a storage vessel size as may be consistent with input rate and service requirements.

For conventional cylindrical shapes the ratio of tank height to diameter should approach unity for minimum heat losses. A considerable departure from this ideal condition may be tolerated without increasing heat losses greatly. For example, a ratio of tank height to diameter of as much as 2 would ordinarily not increase standby losses by more than 10%. A storage vessel of these proportions would obviously in the case of vertical internal flue heaters, permit greater heat transfer areas for the same flue diameter.

Conclusions

1. Pilot input rates may be varied between the minimum rate required for satisfactory lighting and safety device performance and the maximum rate giving freedom from carbon deposition, incomplete combustion, or excessive build-up in stored water temperature without exerting any appreciable effect on percentage standby losses.

2. With greater latitude in pilot rate certain water heater design problems, such as locating the pilot farther away from the thermostatic pilot valve element, may be simplified and field adjustments of pilots may be set high enough to ensure a stable flame limited only by completeness of combustion and deposition of carbon.

3. Reduction of circulation of air through heater flues, during standby periods when the main burner is not operating, generally decreases standby losses and increases service efficiencies.

   a. On heaters designed to produce low flue gas temperatures and low concentrations of excess air in flue gases, use of automatic flue or secondary air dampers to reduce circulation may not be economically justifiable since in such cases the decrease in standby loss is moderate and of the order of less than 10%.

   b. On heaters having high excess air and high flue losses, automatic secondary air or flue outlet control may be very effective, reductions in standby losses of as much as 40% being attainable.

4. Data indicate that with heaters designed for higher thermal efficiencies those having lower input ratings should have the lowest standby losses.

5. Heat losses increase directly as the temperature of stored water is increased while percentage standby loss (heat losses expressed as a percentage of stored heat content) remains substantially constant for reasonable variations in stored water temperatures.

6. Total heat losses during standby increase while percentage standby losses decrease as the capacity of the storage vessel increases, assuming similar shapes.

7. For conventional cylindrical storage vessel shapes a tank height equal to its diameter will provide a condition for minimum heat losses. Increasing the height to twice the diameter for a given storage capacity will increase standby losses about 10%.

Planning Wartime Canteens

Communal feeding is in the news. The growing army of workers in munition factories and other vital industries ; the Forces themselves (we have a larger concentration of troops in this country than ever before and consequently more canteens and rest rooms are called for) ; children in reception areas ; and, in the event of emergency, the civilian population—plans for communal feeding in all these directions, supported by the various Ministries concerned, are being put into operation.

Those responsible for the equipment of canteens of all kinds need to be aware of the latest practice in kitchen layout and fuel requirements. They will welcome, therefore, an addition to the valuable booklets on the subject produced by the Gas Industry. "Canteens for the Forces and the Factories," by illustrating a number of typical installations, brings together much useful information on the planning of kitchens of various sizes. The booklet (Nos. 310 and 311 in the "A Thousand and One Uses for Gas" series) is published by the B.C.G.A., from whom copies can be obtained post free on application.

Company Meeting

GAS CONSOLIDATION, LTD.

The Annual General Meeting of Gas Consolidation, Ltd., was held on July 10 at the Company's Registered Office, 15, Moorgate, London, E.C., Major JULIAN DAY (Chairman of the Company), presiding.

The ASSISTANT SECRETARY (Mr. C. B. Mawer) read the Notice convening the Meeting and the Report of the Auditors.

THE CHAIRMAN'S ADDRESS

The CHAIRMAN said: The Directors' Report and Statement of Accounts have been in your hands for some days and with your permission I shall take them as read.

The figures appearing in the Balance-Sheet show only slight variation from those of the preceding year. On the assets side, Investments in Subsidiary Companies are shown to have increased during the year by £7,533. Almost the whole of this amount represents the cost of acquisition of the Melbourne Gas Light and Coke Company, Ltd., a small company adjacent to the Long Eaton Gas Company. 1,590 "A" ordinary shares were issued to those Melbourne shareholders who wished to exchange their holdings for shares in this Company; all but a few of the remainder surrendered their shares for cash.

Our loans to subsidiary companies have been increased by £56,500. Such loans should be repaid in due course by issues of securities on the part of these companies, but such issues are not feasible at the present time. The next item to which I must call attention is Discount on Debenture Stock, less amount written off, £3,000. In my remarks last year I mentioned that prior to our meeting the Company had placed £50,000 of 3½% Debenture Stock on favourable terms. The total discount and placing commission amounted to £4,000, but provision is made for writing off £1,000 of this amount in the Revenue Account.

On the debit side of the Balance-Sheet, the small increase in the issue of "A" Ordinary Shares to which I have referred is reflected and also the addition to the 3½% Debenture Stock. Loans and deposits last year amounted to £17,000, and this year to a total of £34,500.

In the note at the foot of the Balance-Sheet the Directors report that two subsidiary companies operated at a loss which, in the aggregate, amounted to £1,418. These two small losses have been met out of the accumulated profits of the companies concerned.

Revenue Figures

This brings us to the Revenue Account. Our accounts reflect the results of subsidiary companies up to Dec. 31 last for the most part, although some companies' accounts cover the period ended March 31, 1940. Dividends on investments show a decrease of more than £3,000, which reflects decreased dividends paid by some of our subsidiary companies as a result of current conditions. Other income is just over £1,000 higher. On the debit side there is an increase in the amount required for Debenture interest owing to the placing of the new issue, and an increase of more than £2,000 in the amount required for income-tax. Provision of £1,000 is also made, to be applied to write off by this amount the discount on the Debenture Stock. The balance carried to Appropriation Account is £24,209, being over £4,000 less than for the preceding year.

From the Directors' Report you will note that the Directors recommend a final dividend of 2½%, less tax, on the "A" ordinary shares, making the dividend for the year 5%, less tax, and a final dividend of 3%, less tax, on the "B" ordinary shares, making, with the interim already paid, a dividend at the rate of 5% per annum, less tax, which compares with a total dividend of 6% last year. After giving effect to these dividends, the balance to be carried forward will be increased from £6,822 to £8,622. In the present situation I am sure you will agree with the Directors that a conservative policy in respect of dividends should be followed.

Important Developments

In the circumstances which exist to-day you will hardly expect me to add much information of a general character to this brief review of the published accounts. I must, however, refer to developments concerning the Long Eaton Gas Company, which are of outstanding importance. This Company has now ceased to manufacture gas and receives its supplies from coke ovens in the neighbourhood. This arrangement has only recently come into operation, and figures as to the results obtained are not yet available; but the change-over will undoubtedly result in important economies, and also releases for other purposes the Company's own producing plant.

In these times each individual gas company may be strongly affected by circumstances peculiar to its own area, and over which the management has no control; thus some companies have shown large increases in sales of gas, whereas other companies have experienced substantial decreases in the demands for their products. In the aggregate the companies in this Group sold and produced slightly more gas than in the corresponding period a year ago. In the period of extreme cold experienced last winter there was some dislocation in coal deliveries, causing acute shortage in one or two instances; but, on the whole, production and distribution have continued with no interference.

These are necessarily difficult days for the Gas Industry, which feels acutely rising costs in all directions, as well as the loss of a certain number of employees who have been called to the National Service. In all companies the staff and employees are co-operating wholeheartedly to provide the best possible service, and to them all we are grateful for their increased efforts and longer hours of work. Our companies have been maintained in efficient condition to meet all demands which can be reasonably foreseen.

The Chairman concluded by moving the adoption of the Report and Accounts with the recommendation of a dividend of 2½% on the "A" ordinary shares and 3% on the "B" ordinary shares, making with the interim dividends already paid a total of 5% in each case.

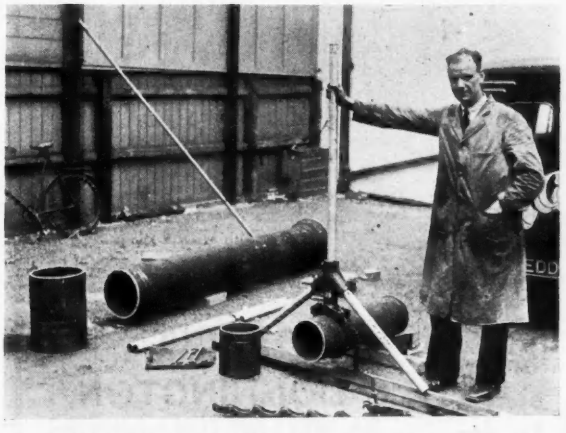
Mr. H. E. IBBS seconded the motion, which was carried unanimously.

The retiring Directors, Mr. G. M. Gill and Mr. H. E. Ibbs, were re-elected, and the Auditors, Messrs. Brown, Fleming & Murray, were re-appointed.

A vote of thanks to the Chairman, Directors, and staff closed the meeting.

A Portable Pipe Vice

The need for light equipment for A.R.P. purposes led to a demonstration at Cheltenham, on Friday last, to a gathering of Gas Managers, of a new portable pipe vice. The photograph



shows two mains, cut by one man, with the aid of a Foster underslung pipe vice. The 12 in. main was fixed in the vice and cut in eleven minutes. The vice holds cast or spun pipes from 3 in. to 12 in. inclusive. Important advantages are that it is light and compact and that as secure grip enables wheel cutters to be effectively employed, one, or two, semi-skilled men can cut mains in much less time than skilled men do with existing portable tackle. The legs and handle are made from standard 1¼ in. gas tubing.

The vice is used as follows:

(1) Roll pipe on to two planks, lift, and slide chain underneath.
(2) Fix body of vice on top of pipe and attach chain.
(3) Roll to one side and insert one leg.
(4) Fix centre handle, lever over, and insert second leg.

The vice was invented by Mr. A. S. Foster, Manager and Engineer of the Stourport Gas Company.

I.H V.E. Competition

In a competition organized by the Institution of Heating and Ventilating Engineers—which is now thrown open to non-members—premiums up to £10 10s. will be awarded for any papers submitted to the Council which are considered of sufficient merit to be published in the monthly *Journal* of the Institution. In addition to gaining a premium, all papers submitted for the competition are eligible also for the Silver and Bronze Medals of the Institution, which are given for papers considered to be specially meritorious.

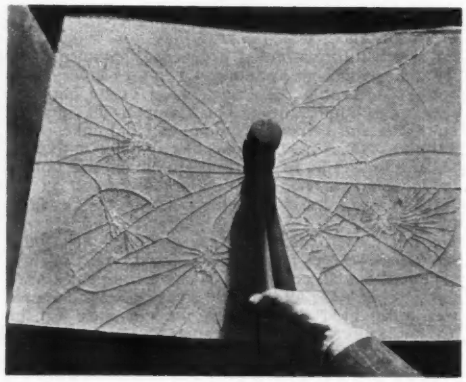
The papers should deal with matters likely to be of interest to the members of the I.H.V.E., and among suggested subjects are heating and ventilating of large garages, underground, &c., heating of factories, high-pressure water heating, hot water services for blocks of flats, tenements, and housing schemes, application of automatic control, &c. It will be noted that the majority of the suggested subjects are of close interest to the Gas Industry.

Further details of this competition, the closing date for the receipt of entries for which is Oct. 1, 1940, are given on a leaflet published by the I.H.V.E., 22, Russell Square, W.C.1.

Trade News

"Foochow" Anti-Shatter Compound

More details are to hand about the "Foochow" anti-shatter compound marketed by Messrs. Donald Macpherson & Co., Ltd., referred to in the "JOURNAL" of July 3 (page 38). Stress is laid on the claim that the only reliable method of treating window glass and roof lights against blast and splinters is to incorporate a material such as butter muslin, cheese cloth, mutton cloth, fine curtain netting or strong paper between two coats of compounds. All types of compounds, states the firm, have been found to suffer from some defect which renders them doubtful in efficiency when used alone; some are prone to embrittlement after a few months' exposure. "Foochow" compound is an elastic



Several heavy hammer blows on a pane of glass treated with "Foochow" anti-shatter compound in conjunction with butter muslin produced the above effect. While the glass was severely cracked the pieces were held securely in place by the treatment

synthetic waterproof material which retains its elasticity and life for a prolonged period, and tests against blast and months of experience have proved the success of the treatment recommended by the makers. The procedure is to coat the glass with one application of the compound, and when this is tacky the butter muslin or other material is pressed evenly on to it. The following day a further coat of compound is applied. Large areas of glass in the company's new roller mill shop were treated throughout in this way last autumn, and when tests were made recently the system proved to be still effective and up to expectations. Butter muslin and similar material does not impede the light entering the room; moreover, it provides extra strength to the window frame, and even though the glass may be cracked by blast, the material, in conjunction with the compound, will avoid the necessity for immediate re-glazing. If more light is desired, very efficient protection can be secured by applying strips of muslin, &c., spaced several inches apart, the application being the same as if the glass were treated all over.

The Babcock Fuel Sampler

Considerable modifications in design have been made in the Babcock fuel sampler produced by Messrs. Griffin & Tatlock, Ltd., Kemble Street, London, W.C.2, for use in the accurate reduction of coal and other crushed and powdered samples for analysis. Introduced some years ago in compliance with British Standard Specification 735, the apparatus remained for a considerable time more or less a scientific curiosity, but within the last few weeks it has become commercially available. The operations involved in the use of the sampler are entirely mechanical, and therefore completely eliminate the systematic personal errors which are seldom absent from hand methods of reduction.

Patent Infringement Action

The Action for infringement of Patent by the Stanton Ironworks Company, Ltd., and others against the Clay Cross Company, Ltd., has been the subject of interlocutory proceedings in the Chancery Division before Mr. Justice Morton.

The Stanton Ironworks Company have for some time been pressing this case forward for trial, but the hearing has been delayed owing to defendants' experiments and the reports and data thereon which defendants desire to put in evidence at the trial not having been completed.

Mr. Justice Morton had directed that these experiments be concluded if possible by July 1, but on an application on behalf of the defendants for a further adjournment and their Counsel stating that the reports of the defendants' experts and data arising thereout could not be completed before the latter part of July, the Judge directed that the trial of the action be adjourned until the early part of next Sittings, when it is expected the action will be finally disposed of.

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Products Prices

The London Market

July 15.

There is little of interest to record in the London Tar Products markets. Owing to the absence of continental demand, it is not possible to give a value for pitch. Creosote is about 4¼d. to 5d. per gallon; refined tar, 3¼d. to 4d. per gallon. The price of pure toluole under the Ministry of Supply Order is 2s. 5d. per gallon; pure benzole, 1s. 10d.; 95/160 solvent naphtha, 1s. 11d. to 2s.; and 90/160 pyridine about 18s. 6d., all per gallon naked; refined naphthalene crystals, £23 per ton in bags, all *ex* makers' works.

The Provinces

July 15.

The average prices of gas-works products during the week were: Pitch.* Toluole, naked, North, 1s. 9½d. (Controlled by the Ministry of Supply Order No. 1, which fixes the maximum price at which this material may be sold). Coal tar, crude naphtha, in bulk, North, 9d. to 9½d. Solvent naphtha, naked, North, 1s. 8d. to 1s. 9d. Heavy naphtha, North, 1s. 4½d. to 1s. 5½d. Creosote, *ex* works, in bulk, North, liquid and salty, 4½d. to 4¾d.; Scotland, 4¾d. to 4¾d.; low gravity, 4¼d. to 4¾d. Fuel Grade, 4d. to 4¼d. Carbolic acid, 60's. 3s. 6d. to 3s. 7½d. Naphthalene, £15 to £20. Salts, 75s. to 85s., bags included. Anthracene, "A" quality, 4½d. to 4¾d. per minimum 40% purely nominal. Heavy oil: Unfiltered anthracene oil, (min. gr. 1,080), 5¼d. to 5½d.; filtered heavy oil (min. gr. 1,080), 5¾d. to 6d.; heavy anthracene oil gr. less than 1,080, 6d. to 6¼d.

* Pitch.—Owing to the Export Trade being at a standstill due to the position in France it is practically impossible at the moment to quote a market price for pitch. For the same reason no quotation can be given for crude gas-works tar. The quoting of a price in last week's "JOURNAL" was an error and the quotation should be ignored.

Scotland

GLASGOW, July 13.

In the home market a little more activity is noticeable, and, in the main, prices are well held.

Refined tar.—A fair throughput is maintained in the home market at 4¼d. to 4½d. per gallon, while for export offers are at 3½d. per gallon, both f.o.r. naked.

Creosote oil.—Consumers are well looked after, with prices approximately as under: Specification oil, 5¼d. to 5½d. per gallon; low gravity, 6¼d. to 6½d. per gallon; neutral oil, 5¾d. to 6¼d. per gallon; all *ex* works in bulk.

Cresylic acid.—Business is on a very restricted scale, with supplies available as under: Pale, 97/99%, 2s. to 2s. 2d. per gallon; pale, 99/100%, 2s. 4d. to 2s. 6d. per gallon; dark, 97/99%, 1s. 9d. to 1s. 11d. per gallon; all *ex* works in buyers' packages.

Crude Naphtha is unaltered at 6½d. to 7¼d. per gallon *ex* works in bulk, according to quality.

Solvent Naphtha.—90/160 grade is 1s. 9d. to 1s. 10d. per gallon, and 90/190 heavy naphtha is 1s. 4½d. to 1s. 5½d. per gallon.

Motor benzole is 1s. 8d. to 1s. 8½d. per gallon.

Pyridine.—Available supplies are offered at 17s. to 18s. per gallon for 90/160 grade and 19s. to 20s. per gallon for 90/140 grade.

Contracts Advertised

Benzole Plant.
Barnoldswick Gas Dept. [p. 134.]

Purchase and Removal of Obsolescent Gas Plant.
Spenborough Gas Dept. [p. 134.]

Demolition of Obsolescent Gas Plant.
Spenborough Gas Dept. [p. 134.]

Gas Undertakings Results

Galashiels

In spite of wartime conditions, an increase in the quantity of gas sold of 1,583,000 cu.ft. was reported at the annual meeting of the Galashiels Gas Light Company. An improvement in the textile trade in the town has resulted in an increased demand for gas in the mills. After the outbreak of war, it was necessary to increase the price of gas by 2d. per 1,000 cu.ft. Regarding the price of gas and the dividend, the Directors considered that the figures justified them in continuing both at the same rates, but they had clearly before them that in the future the price of gas would be uncertain, while in view of the heavy burden in rates and taxes the dividend could hardly be maintained. In estimating the finances for the current year, a reduction in dividend has been allowed for.

Stoke-on-Trent

During the twelve months to March last the sales of the City of Stoke-on-Trent Gas Department reached a record figure of 15,343,436 therms (3,069,036,000 cu.ft.), which compares with a total of 14,975,375 therms (3,186,250,000 cu.ft.) in the preceding twelve months. It is because of an increase in the calorific value of the gas from 470 to 500 B.Th.U. that there is this increase of gas sold in therms, which amounts to 2.47%. The quantity of gas consumed for industrial purposes was 1,550,750,000 cu.ft., or 7,753,750 therms, as against 7,403,950 therms in the previous year. The greater part of this consumption is taken by the ceramic industry—6,545,574 therms, as compared with 6,304,283 therms, an increase of 241,291 therms. Unfortunately, on the outbreak of war, manufacturers with schemes of modernization incorporating the use of town gas for pottery firing to a large extent suspended alterations which they had in view; and this, together with the closing-down of the tile factories, had an adverse effect on the results. The consumption per consumer still continues to increase, having gone up during the twelve months from 196.93 therms to 207.50 therms. The total income for the year is £374,466, as against £365,128 last year, and the profit transferred to Net Revenue Account is £85,365, compared with £80,922.

Trading Result

Peter Brotherhood, Ltd.

Addressing shareholders at the 33rd ordinary general meeting of Peter Brotherhood, Ltd., the Chairman (Mr. A. M. Neal) said that on the assets side of the balance-sheet cash at bank and in hand stood at £127,674—an increase of £8,389 on the previous year's figure. Sundry debtors showed an increase of £10,450, while stock in hand and work in progress stood at £498,284 against £344,445. Both these increases were, of course, attributable to the considerably greater amount of work carried out during the year and at present in hand. On the liabilities side provision for taxation at £70,730 (against £23,228) was a reminder of the extent to which it was the duty of all to place their strength and substance at the service of the Government. General reserve remained at £50,000, but it was proposed t. set aside £10,000, as last year, for special depreciation of machine tools and machinery generally. The net profit for the year, before providing for income-tax and excess profits tax, was £139,050, against a figure last year of £98,174; but income-tax and excess profits tax reduced the amount of profit available for distribution and other purposes to £75,550, against £81,924. In view of the prevailing conditions, and the necessity to conserve the Company's resources, and of the impending increase in the rate of excess profits tax from 60% to 100%, the Board recommended a final dividend of 12% on the ordinary shares, making a total dividend for the year of 20%, against 24% last year.

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GAS STOCKS AND SHARES

There was considerably less activity on the Stock Exchange last week, and in view of the recent substantial recovery in prices this was to be expected. Moreover, the forthcoming heavy increases in taxation will also tend to curtail commitments. Gilt-edged stocks continued to maintain a firm front, and closed fractionally higher on the week—2½% Consols being ¼ up at 72¼. The activity in home rails slackened, and prices weakened slightly. Easier conditions also prevailed in the industrial section, and although on the whole the declines were of a minor character, several of the leaders lost rather heavily.

The Gas Market was by no means neglected, and except in a few isolated cases it seems that the general marking down of values has eased up. The strength of the gilt-edged section continued to assist Gas Light units, which hardened another 3d. to 12s. 6d., while South Metropolitan closed a point higher at 40½. Several parcels of Alliance and Dublin 4% debenture changed hands at over 93, and the quotation finally closed 15 points higher at 92½. The only fall of any consequence was a drop of 7½ in South Suburban ordinary to 65. There were no changes of note in either the Provincial Lists or the Supplementary List.

The first of the interim dividend announcements is that of the Wandsworth Company, which is distributing 2% against 3¼% for the corresponding period of 1939, and the stock is now quoted ex div. at 67.

It is noted that the Commercial ordinary capital has been reduced by £26,070 to £1,748,935. This reduction has presumably been brought about under the powers obtained by the Company's Act of 1940 which authorises the purchase and cancellation of any stocks of the Company.

Official Quotations on the London Stock Exchange

Issue. £	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations July 12.	Rise or Fall on Week.
1,767,439	Mch. 11	8	7	Alliance & Dublin Ord. ...	90—100	...
374,000	July 1	4	4	Do. 4 p.c. Deb. ...	90—95	+15
957,608	May 13	5	5	Ascd. Gas & Water U'd'ts Ord.	12/—14/-	...
500,000	"	4½	4½	Do. 4½ p.c. Red. Cum. Pref.	15/6—17/6	..
535,545	"	4	4	Do. 4 p.c. Red. Cum. Pref.	14/6—16/6	...
336,646	"	4	4	Do. 4 p.c. Irred. Cum. Pref.	12/6—14/6	—/6
750,000	Mch. 18	3½	3½	Do. 3½ p.c. Red. Deb. ...	82—87	...
560,070	Feb. 19	7	7	Barnet Ord. 7 p.c.	115—120	...
300,000	Apl. 8	1/4½	1/9½	Bombay, Ltd.	19/6—21/6	...
181,915	Feb. 26	9½	9½	Bournemouth Sliding Scale ...	145—150	...
690,526	"	7	7	Do. 7 p.c. max. ...	117—122	...
493,960	"	6	6	Do. 6 p.c. Pref. ...	115—120	...
50,000	June 17	3	3	Do. 3 p.c. Deb. ...	65—70	...
362,025	"	4	4	Do. 4 p.c. Deb. ...	90—95	+3
335,000	"	5	5	Do. 5 p.c. Deb. ...	95—100	...
357,900	Feb. 19	7½	6½	Brighton, &c., 6 p.c. Con. ...	103—108	.
659,955	"	6½	5⅞	Do. 5 p.c. Con. ...	90— 95	...
205,500	"	6	6	Do. 6 p.c. 'B' Pref. ...	103—108	...
855,000	Mch. 11	7	8	British Ord.	85—95	...
100,000	June 17	7	7	Do. 7 p.c. Pref.	112—117	...
350,000	"	5½	5½	Do. 5½ p.c. 'B' Cum. Pref.	110—115	...
120,000	"	4	4	Do. 4 p.c. Red. Deb.	75—80	...
450,000	"	5	5	Do. 5 p.c. Red. Deb. ...	93—98	...
100,000	22 May '33	6	4	Cape Town, Ltd.	½—¾	...
100,000	6 Nov. '33	4½	4½	Do. 4½ p.c. Pref.	½—¾	...
150,000	June 17	4½	4½	Do. 4½ p.c. Deb.	52—57	...
626,860	Jan. 29	6	5⅜	Cardiff Con. Ord.	90—100	...
237,860	June 17	5	5	Do. 5 p.c. Red. Deb. ...	95—100	...
98,936	Apl. 8	2/-	2/-	Colombo Ord.	1½—1½	...
24,510	"	1/4½	1/4½	Do. 7 p.c. Pref.	19/6—21/6	...
739,453	Mch. 26	-/11.48	-/11.48	Colonial Gas Assn. Ltd. Ord. ...	14/6—16/6	...
296,144	"	1/3.30	1/3.30	Do. 8 p.c. Pref.	20/—22/-	...
1,748,935	Jan. 29	4	2	Commercial Ord.	37—42	-½
140,000	Feb. 19	4	4	Do. 4 p.c. Red. Pref. ...	87—92	...
620,000	June 10	3	3	Do. 3 p.c. Deb.	58—63	...
286,344	Feb. 19	5	5	Do. 5 p.c. Deb.	90—95	-5
200,000	"	3¾	3¾	Do. 3¾ p.c. Red. Deb. ...	90—95	-3
807,560	Feb. 12	7	7	Croydon sliding scale	88—98	...
644,590	"	5	5	Do. max. div.	85—90	...
620,385	July 1	5	5	Do. 5 p.c. Deb.	90—95	-3
208,660	Feb. 19	5	5	Dudley, Brierley Hill & Dist. Ord.	98—103	...
82,275	"	5	5	Do. 5 p.c. Con. Pref. ...	93—98	...
79,000	"	3¾	3¾	Do. 3¾ p.c. Red. Deb. ...	93—98	...
239,000	Jan. 29	5	88/6	East Hull Ord. 5 p.c.	70—80	...
187,215	Feb. 12	5⅛	5⅛	East Surrey Ord. 5 p.c. ...	93—98	...
176,211	June 17	5	5	Do. 5 p.c. Deb. ...	92—97	-3
250,000	July 8	4	6	Gas Consolidation Ord. 'B' ...	13/—15/-*	—/6
250,000	May 13	4	4	Do. 4 p.c. Red. Cum. Pref.	15/—17/-	...
19,152,410	Jan. 29	5⅜	3⅜	Gas Light & Coke Ord. ...	12/—13-/a	+/3
2,600,000	"	3½	3½	Do. 3½ p.c. max.	55—60	..
4,477,106	"	4	4	Do. 4 p.c. Con. Pref. ...	77—82	-1
2,993,000	July 8	3¾	3¾	Do. 3¾ p.c. Red. Pref. ...	78—83*	-2
8,602,497	June 3	3	3	Do. 3 p.c. Con. Deb. ...	61—66	...
3,642,770	"	5	5	Do. 5 p.c. Red. Deb. ...	99—104	...
3,500,000	"	4½	4½	Do. 4½ p.c. Red. Deb. ...	95—100	...
700,000	Mch. 11	3½	3½	Do. 3½ p.c. Red. Ded. ...	80—85	...
270,466	Feb. 19	6	6	Harrogate New Cons.	93—98	...
157,500	Apl. 8	‡1/-	‡1/-	Hong Kong and China Ord. ...	½—¾	...
5,600,000	May 13	4	8	Imperial Continental Cap. ...	30—40	...
172,810	Jan. 29	3½	3½	Do. 3½ p.c. Red. Deb. ...	64—69	-6
63,480	June 24	3	3	Maidstone 3 p.c. Deb.	54—59	...
45,000	June 10	†8	†10	Malta & Mediterranean ... Metropolitan (of Melbourne) ...	88—98	...
392,000	Apl. 1	5½	5½	5½ p.c. Red. Deb.	95—100	...
231,977	Feb. 19	5	5	M.S. Utility 'C' Cons.	75—80	...
968,658	"	4	4	Do. 4 p.c. Cons. Pref. ...	77—82	...
390,076	June 24	4	4	Do. 4 p.c. Deb. ...	85—90	...

Issue. £	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations July 12.	Rise or Fall on Week.
148,955	June 24	5	5	M.S. Utility 5 p.c. Deb. ...	95—100	...
125,000	July 1	3½	3½	Do. 3½ p.c. Red. Bds. ...	87—92*	...
675,000	May 6	†4	†4	Montevideo, Ltd.	55—60	...
250,000	Mch. 18	7½	5 7/10	North Middlesex 6 p.c. Con. ...	103—108	..
396,160	Jan. 29	5	5	Northampton 5 p.c. max. ...	97—102	...
300,000	Apl. 29	9	7	Oriental, Ltd.	108—113	...
468,537	June 3	7	8	Plymouth & Stonehouse 5 p.c.	105—115	...
621,667	Feb. 5	8½	8½	Portsmouth & Gosport Cons.	100—105	...
241,446	"	5	5	Do. 5 p.c. max.	75—80	...
73,350	"	5	5	Do. 5 p.c. Pref.	87—92	...
75,000	"	4	4	Do. 4 p.c. Pref.	72—77	...
114,000	Feb. 5	5	5	Preston 5 p.c. Pref.	88—93	...
247,966	June 17	4	4	Primitiva 4 p.c. Cons. Deb. ...	91—96	...
625,959	Jan. 15	4	4	Do. 4 p.c. Red. Deb. ...	91—96	...
15,000	Mch. 11	6	6	San Paulo 6 p.c. Cum. Pref. ...	4½—6½	...
441,275	Apl. 29	1/1½	1/1½	Severn Val. Gas Cor. Ld. Ord.	14/—16/-	- 1/6
460,810	Mch. 11	-/10⅝	-/10⅝	" " 4½ p.c. Cum. Pref. ...	16/—18/-	—/6
133,201	Feb. 12	8½	5	Shrewsbury 5 p.c. Ord. ...	105—115	...
9,000	June 17	†4	‡5	South African Ord.	3½—4½	...
1,996,297	Apl. 29	1/2⅜	1/	South East'n Gas Cn. Ld. Ord.	11/—13/-	..
1,000,000	Mch. 4	-/10½	-/10⅝	Do. 4½ p.c. Red. Cum. Pref.	14/—16/-	...
769,191	"	4	4	Do. 4 p.c. Cum. Pref. ...	13/—15/-	...
450,000	Feb. 12	4	4	Do. 4 p.c. Red. Deb. ...	95—100	...
150,000	"	3½	3½	Do. 3½ p.c. Red. Deb. ...	89—94	...
6,709,895	"	5	4	South Met. Ord.	38—43	+1
1,135,812	"	6	6	Do. 6 p.c. Irred. Pref. ...	100—110	..
850,000	"	4	4	Do. 4 p.c. Irred. Pref. ...	78—83	...
1,895,445	July 1	3	3	Do. 3 p.c. Deb.	60—65	...
1,000,000	Jan. 15	5	5	Do. 5 p.c. Red. Deb. ...	97—102	...
600,000	"	3¾	3¾	Do. 3¾ p.c. Red. Deb. ...	92—97	...
1,543,795	Feb. 5	6	3	South Suburban Ord. 5 p.c. ...	60—70	-7½
512,925	July 8	5	5	Do. 5 p.c. Pref.	88—93*	-2
500,000	"	4	4	Do. 4 p.c. Pref.	71—76*	-2
250,000	"	3¾	3¾	Do. 3¾ p.c. Red. Pref. ...	80—85*	-2
888,587	June 10	5	5	Do. 5 p.c. Deb.	95—100	...
250,000	"	4	4	Do. 4 p.c. Deb.	85—90	...
200,000	Feb. 12	3½	3½	Do. 3½ p.c. Red. Deb. ...	87—92	...
427,859	Apl. 15	-/9⅜	1/2⅜	S. Western Gas & Water Ord.	13/—15/-	...
160,523	"	-/10⅜	-/10⅜	Do. 4½ p.c. Red. Cum. Pref.	15/—17/-	...
110,000	June 17	4	4	Do. 4 p.c. Red. Deb. ...	85—90	...
750,541	Feb. 5	5	5½	Southampton Ord. 5 p.c. ...	73—78	..
148,836	June 17	4	4	Do. 4 p.c. Deb.	82—87	..
350,000	Feb. 12	5½	5½	Swansea 5½ p.c. Red. Pref. ...	97—102	...
200,000	June 24	3½	3½	Do. 3½ p.c. Red. Deb. ...	85—95	...
1,076,490	Feb. 26	6½	5	Tottenham and District Ord....	87—92	...
409,835	"	5½	5½	Do. 5½ p.c. Pref.	100—105	...
62,235	"	5	5	Do. 5 p.c. Pref.	90—95	...
453,380	June 10	4	4	Do. 4 p.c. Deb.	85—90	..
1,247,505	May 20	4	6	U. Kingdom Gas Cor. Ord. ..	12/6—14/6	...
1,085,952	May 13	4½	4½	Do. 4½ p.c. 1st Cum. Pref. ...	14/—16/-	...
772,709	"	4	4	Do. 4 p.c. 1st Red. Cum. Pf.	14/—16/-	...
745,263	June 17	4½	4½	Do. 4½ p.c. 2nd Non-Cum. Pf.	12/6—14/6	...
1,093,656	Mch. 18	3½	3½	Do. 3½ p.c. Red. Deb. ...	83—88	...
378,106	Mch. 11	7	7	Uxbridge, &c., 5 p.c.	95—100	...
133,010	"	5	5	Do. 5 p.c. Pref. ...	95—100	...
1,371,138	July 8	3½	4	Wandsworth Consolidated ...	62—72*	-3½
2,525,768	"	4	4	Do. 4 p.c. Pref.	72—77*	-1
1,343,964	June 17	5	5	Do. 5 p.c. Deb.	93—98	...
383,745	"	4	4	Do. 4 p.c. Deb.	85—90	..
400,000	"	3¾	3¾	Do. 3¾ p.c. Red. Deb. ...	87—92	...
558,342	Jan. 29	6¼	6	Watford and St. Albans Ord. ...	93—98	-2
200,000	"	5	5	Do. 5 p.c. Pref.	90—95	...
200,000	"	5½	5½	Do. 5½ p.c. Pref.	100—105	...
200,000	"	4	4	Do. 4 p.c. Rd. Pf. (1973/8)	85—90	...
100,000	"	33/4½	4	Do. 4 p.c. Red. Pf. (1959)	93—98	...
203,000	June 10	3½	3½	Do. 3½ p.c. Red. Deb. ...	85—90	...

a.—The quotation is per £1 of Stock. * Ex. Div. † Paid free of income-tax. ‡ For year. § Actual.

Supplementary List and Provincial Exchanges overleaf.

STOCK AND SHARE LIST—Contd.

Supplementary List, not Officially Quoted, London

Issue. £	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Nominal Quotations July 12.	Rise or Fall on Week
202,152	Mch. 18	5	5	Ascot Ord.	80—85	...
128,182	Dec. 27	5	5	Do. 5 p.c. Pref. ...	85—90	- 3
31,035	Mch. 4	-/9⅜	-/9⅜	Associated Utilities 4 p.c. Pref.	15/—17/-	...
100,000	June 24	3½	3½	Do. 3½ p.c. Red. Deb. ...	87—92	...
17,000	Feb. 19	8	8	Bognor Orig. Ord. 'A' ...	102—112	...
62,210	„	8	8	Do. New Add. 'A' ...	102—112	...
87,160	„	7	7	Do. New 7 p.c. max. ...	95—105	...
37,440	Jan. 29	10	10	Cam. Univ. & Town 10 p.c. max.	145—155	...
125,970	„	7	7	Do. 7 p.c. max.	100—110	...
39,025	„	5	5	Do. 5 p.c. max.	80—90	...
96,410	Jan. 29	4½	4½	Cardiff 4½ p.c. Pref. ...	90—95	...
55,520	Feb. 19	6	6	Colchester 6 p.c. Pref. ...	100—105	...
90,550	Mch. 18	5	5	Do. 5 p.c. Deb. ...	95—100	...
150,000	Feb. 12	4	4	Croydon 4 p.c. Pref. ...	77—82	- 5
120,000	July 1	4	4	Do. 4 p.c. Deb. ...	82—87	- 1
65,000	Mch. 4	7½	6⅞	Eastbourne 'A' 5 p.c. ...	100—105	...
198,000	„	6	5⅝	Do. 'B' 3½ p.c. ...	78—83	...
112,312	„	5	5	Do. 5 p.c. Pref. ...	90—95	...
130,000	June 24	5	5	Do. 5 p.c. Deb. ...	95—100	...
130,500	Feb. 19	7½	7½	Exeter New Ord. (£10)	12—14	...
24,000	Aug. 21	8½	8½	Gt. Yarmouth 8½ p.c. max. (£30)	15—20	...
59,400	„	7½	7½	Do. 7½ p.c. max. (£30) ...	10—15	...
51,160	June 10	5½	5½	Do. 5½ p.c. Deb.	100—105	...
152,600	Feb. 26	8	9	Guildford Cons.	110—120	...
54,055	„	5	5	Do. 5 p.c. Pref.	90—95	...
68,250	June 17	5	5	Do. 5 p.c. Deb.	95—100	...
156,600	Feb. 19	7	5	Hampton Court Cons. ...	75—85	...
86,046	June 17	5	5	Holyh'd&N.W.G.&W.Cpn.Ord.	13/—15/-	...
80,000	Feb. 12	4	4	Lea Bridge 4 p.c. Pref.	75—80	...
60,000	„	6	6	Do. 6 p.c. Pref.	105—115	...
94,876	June 17	4	4	Do. 4 p.c. Deb.	85—90	...
73,620	Mch. 18	8½	8½	Luton Cons. 'A'	115—125	...
107,960	Feb. 26	4	5½	Mid Kent Ord. (£10)	7½—8½	...
230,940	Feb. 5	10	10	Oxford & District Ord. ...	135—145	...
47,112	„	5	5	Do. 5 p.c. Pref.	85—90	...
50,000	„	6	6	Do. 6 p.c. Red. Pref. ...	100—105	...
126,193	May 13	7½	7½	Peterborough Ord.	138—148	...
64,990	Mch. 18	7	7	Redditch Ord.	100—110	...
166,850	Feb. 19	8	8	Romford Ord.	100—110	...
60,000	„	4	4	Do. 4 p.c. Pref.	85—90	...
44,000	Mch. 18	5	5	Do. 5 p.c. Deb.	95—100	...
25,570	Feb. 12	5½	5½	Rugby 5½ p.c. Pref.	100—110	...
25,000	„	6	6	Do. 6 p.c. Red. Pref. ...	100—105	...
42,750	Dec. 11	5½	5½	Do. 5½ p.c. Deb.	102—107	...
110,950	Feb. 26	8	8	Ryde Ord.	100—110	...
270,086	Mch. 18	7	7	Slough Ord.	98—103	...
21,000	June 10	5	5	Do. 5 p.c. Deb.	95—100	...
28,872	May 13	5½	5½	S. Midland Gas Cpn. Ltd. Ord.	14/—16/-	...
28,866	Mch. 18	4½	4½	Do. 4½ p.c Red. Cum. Pref.	14/—16/-	...
127,228	Feb. 19	5	7	Swindon Cons.	75—80	...
60,425	June 24	5	5	Do. 5 p.c. Deb.	90—95	...
64,380	June 17	5	5	Torquay & Paignton 5 p.c. Pref.	83—88	...
130,000	Feb. 12	5	5	Wakefield Ord.	85—95	...
81,650	„	5	5	Do. 5 p.c. max.	75—80	...
82,000	Jan. 29	6	6	Weymouth Ord.	82—87	...
273,626	Feb. 12	7	7	Wolverhampton Cons. Ord. ...	115—120	...
98,384	„	6	6	Do. 6 p.c. Pref.	105—115	...
160,000	June 17	5½	5½	Do. 5½ p.c Red. Deb. ...	98—103	...
106,490	Mch. 18	5½	5½	Wrexham Ord	75—85	...
90,000	June 24	5	5	York 5 p.c. Red. Deb.	94—99	...
133,640	Feb. 19	6	6	Yorktown (Cam.) 5 p.c. Cons.	82—87	...
120,000	„	5	5	Do. 5 p.c. Pref.	85—90	...
35,000	June 17	5½	5½	Do. 5½ p.c. Deb.	103—108	...

BRISTOL EXCHANGE

Issue. £	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations July 12.	Rise or Fall on Week
347,756	Feb. 1	5	6	Bath Cons.	100—105	...
1,667,250	Feb.	5	5	Bristol, 5 p.c. max.	88—92	...
120,420	June 17	4	4	Do. 1st 4 p.c. Deb.	94—96	-1½
415,250	„	4	4	Do 2nd 4 p.c. Deb. ...	91—95	...
328,790	„	5	5	Do. 5 p.c. Deb.	109—112	...
274,000	Feb. 26	5	5	Newport (Mon.) Ord.	91—94	...
13,200	Mch. 26	7	8⅔	Pontyp'l Gas & W. 10 p.c. 'A'	11½—12½	...
13,600	„	5	6	Do. 7 p.c. 'B'	9½—10½	...
40,000	„	5	6	Do. 7 p.c. 'C'	9½—10½	...
140,778	Feb. 12	5	5	Weston-super-Mare Cons. ...	88—92	...
64,338	Dec. 27	4	4	Do. 4 p.c. Deb.	90—95	...
33,340	„	7½	7½	Do. 7½ p.c. Deb.	140—150	...

LIVERPOOL EXCHANGE

Issue. £	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations July 12.	Rise or Fall on Week
157,150	Feb. 5	5	6½	Chester 5 p.c. Ord.	98—101	...
92,500	June 17	4	4	Do. 4 p.c. Pref.	83—87	...
36,430	„	3½	3½	Do. 3½ p.c. Deb.	84—87	...
41,890	„	4	4	Do. 4 p.c. Red. Deb. ..	94—98	...
2,167,410	Feb. 19	6	6	Liverpool 5 p.c. Ord.	100—102	...
245,500	June 17	5	5	Do. 5 p.c. Red Pref. ...	99½—102½	...
306,083	July 17	4	4	Do. 4 p.c. Deb.	99—101	...
106,280	Feb. 5	10	8	Preston 'A' 10 p.c.	160—170	...
188,219	„	7	7	Do. 'B' 7 p.c.	115—125	...

NEWCASTLE EXCHANGE

Issue. £	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations July 12.	Rise or Fall on Week
122,577	Feb. 19	7	7	Blyth 5 p.c. Ord.	113—118	...
732,000	Feb. 19	4	4	Hartlepool G. & W. Cn. & New	65—68	...
2,430,267	Feb. 5	5	5 7/10	Newcastle & Gateshead Con.	17/—19/⌀	...
682,856	„	4	4	Do. 4 p.c. Pref.	82—87	...
776,706	Dec. 27	3½	3½	Do. 3½ p.c. Deb.	80—85	...
277,285	April 24	5	5	Do. 5 p.c. Deb. '43 ...	97—102	...
332,351	Feb. 5	6	6	Sunderland 6 p.c. max. ...	111—113	...

NOTTINGHAM EXCHANGE

Issue. £	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations July 12.	Rise or Fall on Week
542,270	Feb. 12	6	9	Derby Con.	103—108	...
55,000	June 10	4	4	Do. 4 p.c. Deb. ...	96—102	...
20,000	June 24	5	5	Long Eaton 5 p.c. Pref. ..	9—11	..
80,000	June 24	5	5	Do. 5 p.c. Deb. ...	100—105	..

SHEFFIELD EXCHANGE

Issue. £	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations July 12.	Rise or Fall on Week
10,000	Feb. 19	10	10	Great Grimsby 'A' Ord. ...	170—180	...
6,500	„	10	10	Do. 'B' Ord. ..	170—180	...
79,000	„	10	10	Do. 'C' Ord. ..	160—170	...
1,806,339	Feb. 26	6½	6½	Sheffield Cons.	119—122	..
95,000	July 8	4	4	Do. 4 p.c. Deb.	96½—98¾	- 1

a The quotation is per £1 of Stock.
* Ex. div ‡ For year.

THIS WEEK'S ADVERTISERS

	PAGE
Alder and Mackay, Ltd.	132
Ascot Gas Water Heaters, Ltd. ..	... Cover I
Askam, John F.	98
Baldwins, Ltd.	101
Bale & Church, Ltd.	133
Birmingham Electric Furnaces, Ltd.	109
Blakeley, Firth, Sons, & Co., Ltd.	133
Boydell, E. & Co., Ltd.	102
Bratt Colbran, Ltd.	95
British Furnaces, Ltd.	96
Bugden, T., & Co.	132
Cellactite & British Uralite, Ltd.	94
Chaseside Engineering Co., Ltd.	107
Cohen, George, Sons & Co., Ltd.	133
Cookson Lead & Antimony Co., Ltd.	131
Cowan, W. & B.	Cover III
Cutler, Samuel, & Sons, Ltd.	131
Dempster, Robert, & Sons, Ltd.	133
Donkin Co., Ltd. (The Bryan) ...	Cover II
Drakes, Ltd.	105
Ellison Insulations Ltd.	134
Evans, Joseph, & Sons (Wolverhampton), Ltd.	136
Fluxite, Ltd.	133
Foster, Blackett & James, Ltd.	131
Gas Meter Co., Ltd.	98
Gas Purification and Chemical Co., Ltd. ...	133
Glover, George, & Co., Ltd.	93
Glover, Thos., & Co., Ltd.	110
Goodall, Clayton, & Co., Ltd.	Cover IV
Grace, Henry & Co.	131
Green & Boulding, Ltd.	133
Griffiths Bros. & Co. (London), Ltd.	119
Holmes, W. C., & Co., Ltd.	135
Humphreys & Glasgow, Ltd.	108
Keith Blackman, Ltd.	136
Key Engineering Co., Ltd.	Cover IV
Kings Patent Agency, Ltd.	133
Kirkham, Hulett, & Chandler, Ltd.	132
Kleenoff Co.	133
Laidlaw, R., & Son (Edin.), Ltd.	96
Lead Industries Development Council ...	99
Le Bas Tube Co., Ltd.	101
Librex Lead Co., Ltd.	131
Locke, Lancaster & W. W. & R. Johnson & Sons, Ltd.	131
London Lead Oxide Co.	131
Main, R. & A., Ltd.	122
Manchester Oxide Co., Ltd.	103
Mavitta Drafting Machines, Ltd.	132
Meltham Silica Firebrick Co., Ltd.	100
Menno Compressed Air Greasecup Co., Ltd. ...	134
Mewburn, Ellis, & Co.	133
Ministry of Supply	97
Mitchell, H., & Co.	132
National Enamels, Ltd.	Cover II
Newton Chambers & Co., Ltd.	116
Parkinson, W., & Co.	110
Peckett & Sons, Ltd.	Cover IV
Press, William, & Son	106
Pulsometer Engineering Co., Ltd. ...	Cover IV
Radiation, Ltd.	...120, 121
Reavell & Co., Ltd.	100
Saunders Valve Co., Ltd.	104
Siebe, Gorman, & Co., Ltd.	106
Stone, J., & Co., Ltd.	104
Strachan & Henshaw, Ltd	93
Thomas & Bishop, Ltd.	127
Thompson, J. (Wolverhampton), Ltd.	102
Trotter, Haines, & Corbett, Ltd.	133
Tully, Sons, & Co., Ltd.	131
Underpressure Engineering Co., Ltd	134
Walker, C. & W., Ltd.	126
Walker, James, & Co., Ltd.	106
Walkers, Parker & Co., Ltd.	131
Watkins & Watson	134
West's Gas Improvement Co., Ltd.	128
Wilkinson, William	106
Woodall-Duckham Co., Ltd.	115
Appointments Vacant and Wanted	134
Company Notices	133
Contracts Open	134
Educational	133
Patents	133
Plant, &c.	133
Plants, &c., Wanted and for Sale	133

CONTENTS

EDITORIAL NOTES.

B.C.G.A. Activities 151
Exterior Lighting 151
Reactive Coke 152
Regulation of Coal and Gas Consumption ... 152
Coal By-Products 152
Coke Marketing 152
Industrial Welfare 152

Physical Problems in Industry 152
Irish Association 152
Personal 153
Obituary—Samuel Milne 153
News of the Week 153

Directory of British Fine Chemicals 153
Feeding of London School Children 153
A Century-and-a-Quarter of Gas at Liverpool ... 154
Guildford Technical College and Art School Kitchen 154
Supplement to BS/ARP 33 154
Closing of Adderley Street Works 157
Campaign for Collection of Old Linen Drawings 157
Gas Meter Testing at Nottingham 157
H.R.H. Duchess of Kent Visits A.R.P. Exhibition at the Housing Centre, S.W.1 157
Coal By-Products. From the July Issue of "Industrial and Engineering Chemistry." By William H. Carmody and Harold E. Kelly 158

Grading of Material. From Vol. 141, No. 6, "Proceedings of The Institution of Mechanical Engineers" 164
Marketing Coke in Vancouver (Abstract from the "Canadian Gas Journal.") By Hugh Grace 165
Gas Burner Patent 166
Carbonisation Under Pressure 166
Gas-Supply Control Valves 171
Fire Hazards with Aluminium Paint 171
Gas Undertakings' Results 167
Trading Results—W. and T. Avery 167
Products Prices 167
Dividends Announced 167

Gas Stocks and Shares 169
Stock and Share Lists ... ... 169 & 170

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Advertisement Index, see p. 170.

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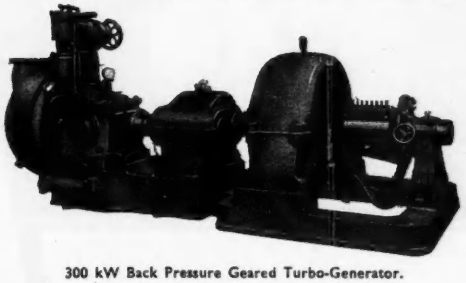

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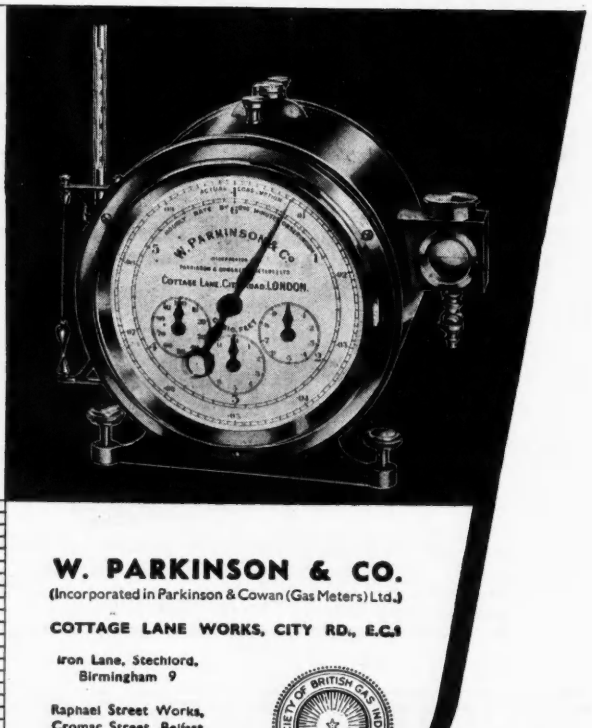

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P4